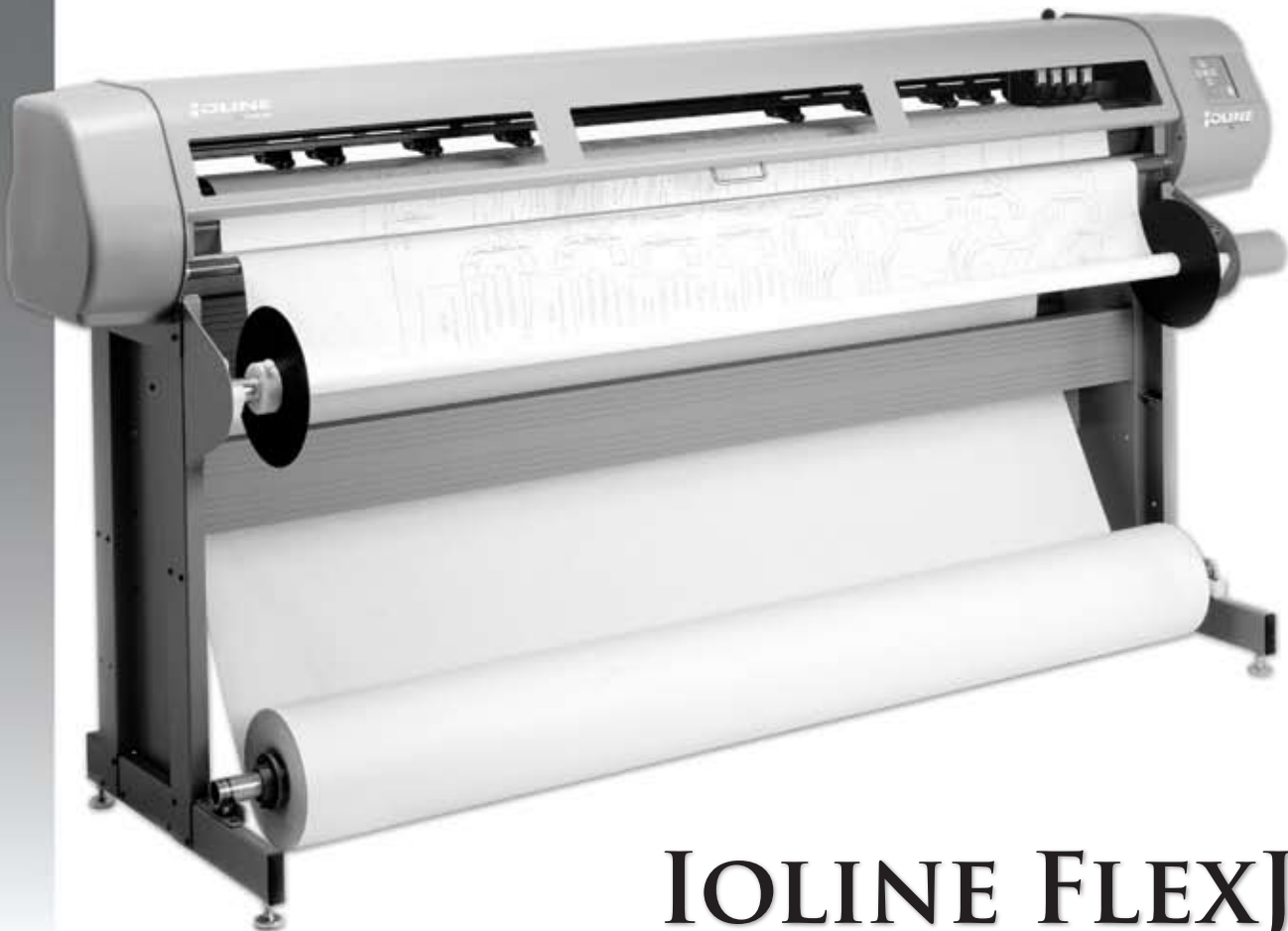




User Guide



IOLINE FLEXJET™

USER NOTICE

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Service and Support

If you require assistance with an Ioline product, your local Ioline dealer or authorized service center is ready to help. Support information is also available 24/7 on the Ioline Web site—or you may contact Ioline directly:

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IOLINE FLEXJETTM

User Guide

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GLOSSARY

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SAFETY & CAUTIONS

The Ioline FlexJet has many fast moving components. Please read and follow these safety guidelines before beginning operation of the printer:

- ***Do not try to repair the machine without factory authorization.*** Only qualified service personnel should attempt any disassembly or access to internal components. If external mechanical adjustments are necessary, turn off the printer and disconnect it from all power sources (both the computer and the wall outlet).
- ***Be careful with hair, jewelry, or loose clothing near the printer.*** They can become caught in the mechanical parts.
- ***Never attempt to move the carriage by hand when the power is on.*** Always use the **Arrow** keys to move the carriage. To park the carriage safely in the **Service Station** and protect the print cartridges, press the **Clean** button.
- ***Keep hands away from the carriage when the printer is in operation.*** The carriage will automatically move to touch the left end plate then back to the right end (the **Service Station** position) when the power is turned on.
- ***Never insert hands or other objects into the Service Station area on the right side of the printer.*** The carriage occasionally enters this area without warning and could collide with an obstruction, potentially causing and injury.
- ***Be careful when moving or lifting the printer.*** Moving the printer requires at least 2 people. To avoid injury to your fingers, do not lift the printer by the end covers. Hold the gray bars on the printer to lift or move it. See *Figure 1*.
- ***Keep fingers away from the drive shaft when the printer is in operation.*** Serious injury could result.



Figure 1. Lift the printer head using the gray bars to avoid injury to your fingers.

KEY

- | | |
|-------------------------------|-------------------------|
| A. Left End Cover | F. Feed Roll |
| B. Safety Cover | G. Take-up Shaft |
| C. Right End Cover | H. Feed Shaft |
| D. Take-up Motor | I. Stand |
| E. Stand Leveling Foot | |

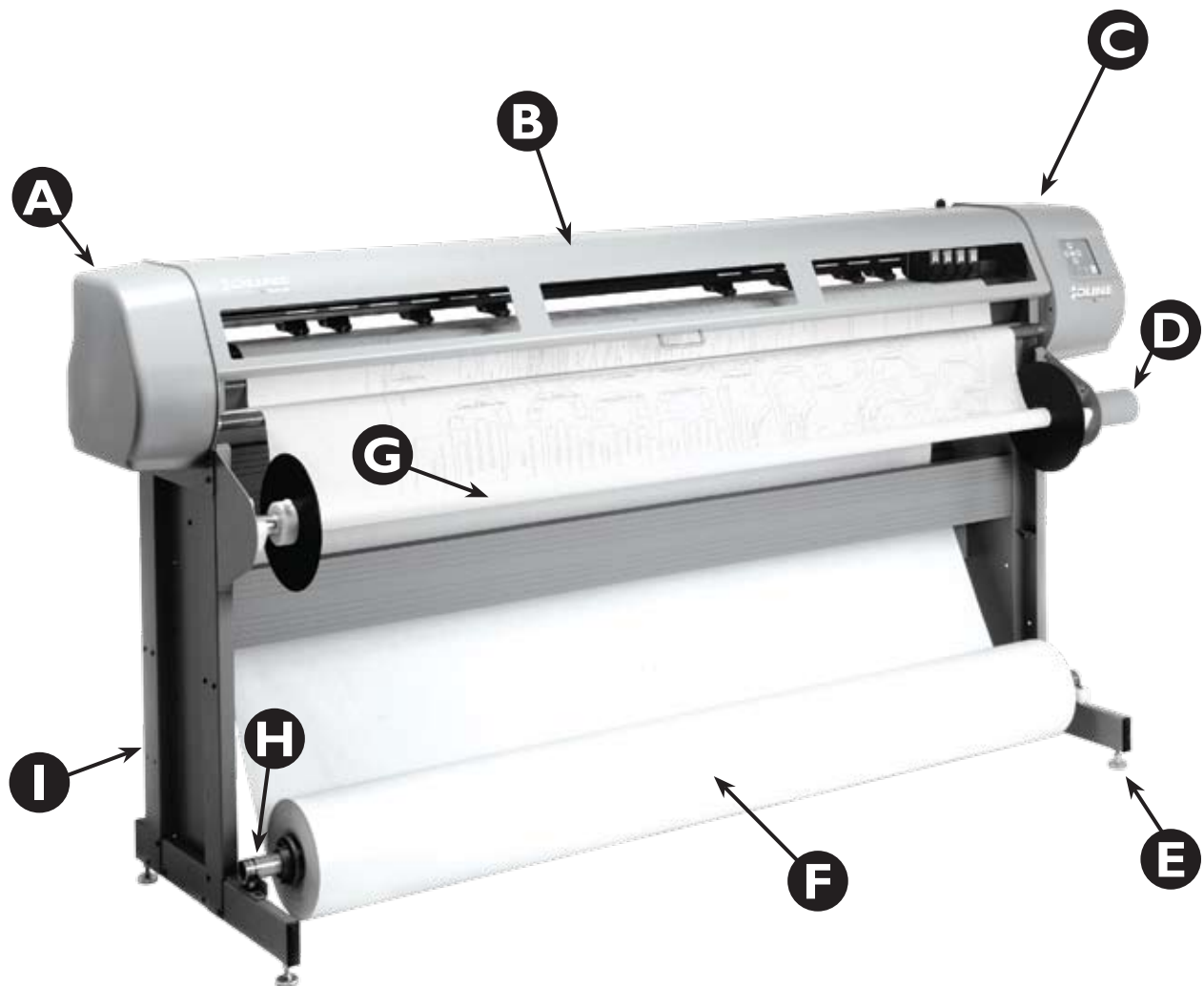


Figure 2. The Ioline FlexJet Printer Front View.

VISUAL REFERENCE GUIDE

KEY

- | | |
|--------------------------------|--------------------------------------|
| J. Take-up Motor Cable | N. Platen Leveling Foot |
| K. Take-up Motor Outlet | O. Cross-member |
| L. Serial & USB Ports | P. Paper Out Sensors (hidden) |
| M. Power Switch | |

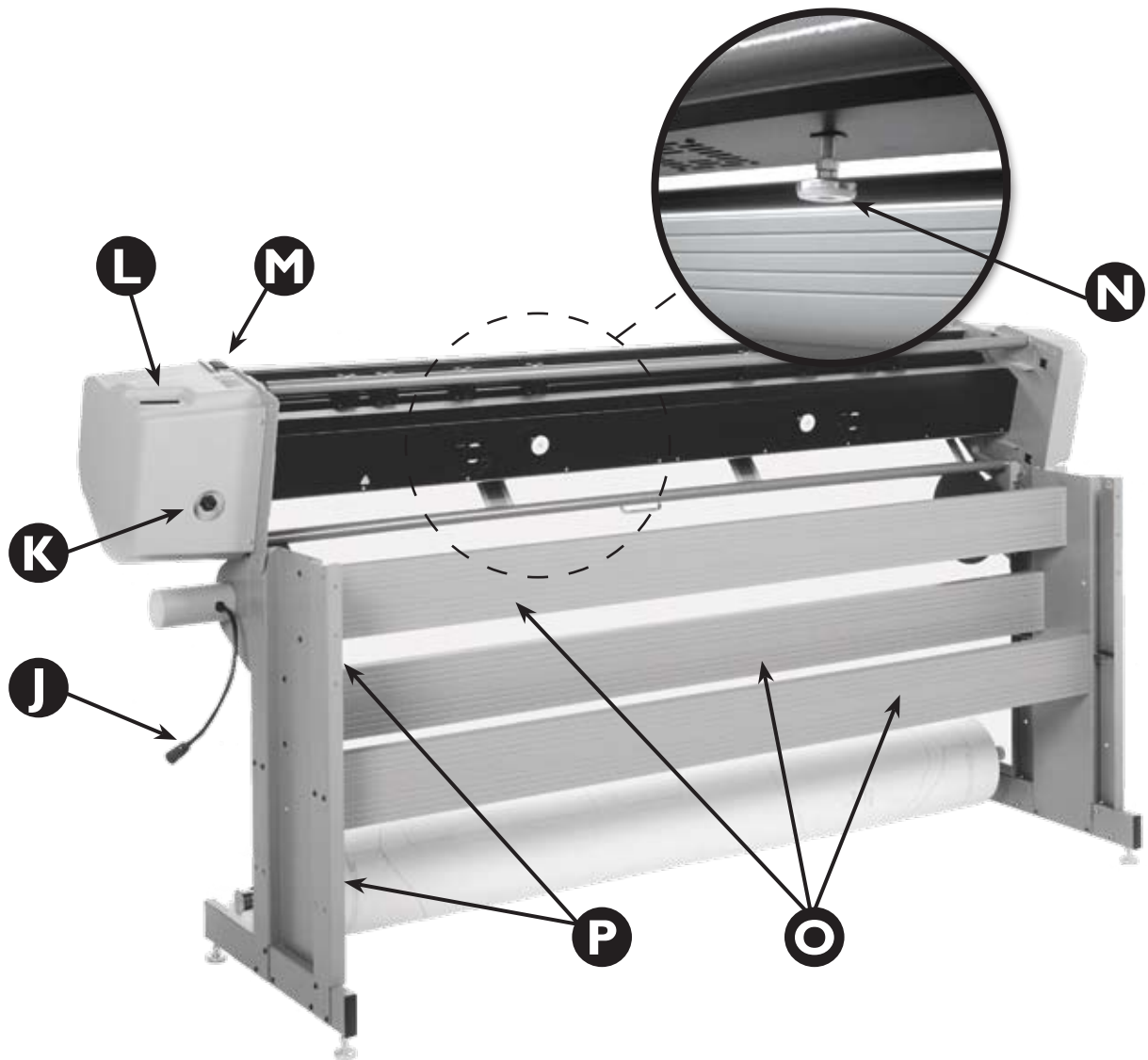


Figure 3. The Ioline FlexJet Printer Rear View (head tilted in maintenance position.)

KEY

- | | |
|--|------------------------------|
| Q. Ink Cartridge Stall | V. Take-up Sensor |
| R. Cartridge Stall Latch | W. Platen |
| S. Pinchwheel Lever | X. Pinchwheel |
| T. Keypad | Y. Drive Shaft Marker |
| U. Service Station
(Beneath Cover) | Z. Traverse |
| | AA. Carriage Assembly |

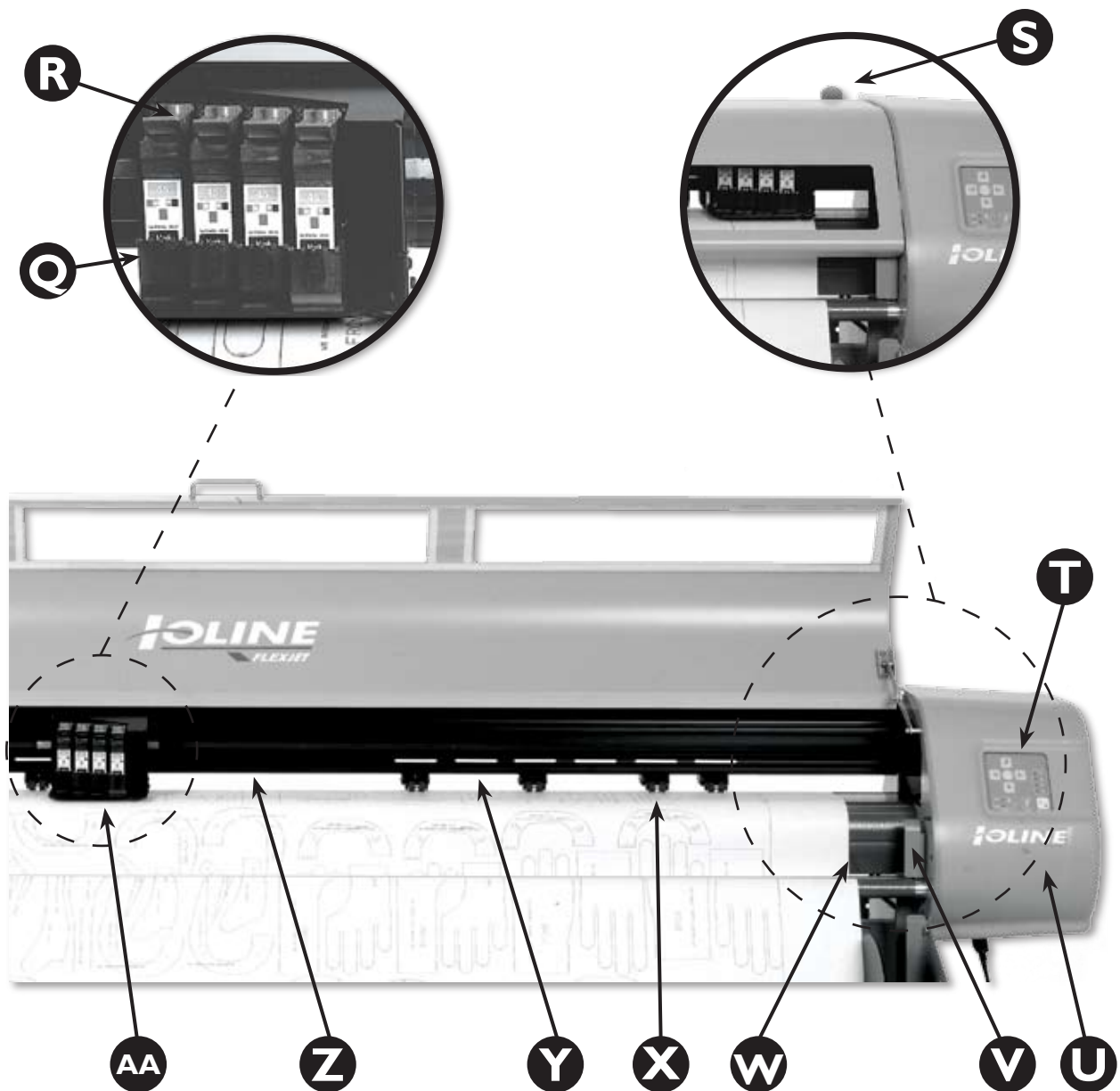


Figure 4. The Ioline FlexJet Printer Front View Close-up (safety cover lifted for clarity.)

Getting Started

Thank you for purchasing the Ioline FlexJet.

This manual contains instructions and guidelines for setting up, operating and maintaining the Ioline FlexJet printer. The following components are needed to create markers:

- A FlexJet assembled according to the directions outlined in the *FlexJet Quick Start Guide*.
- A computer system that is properly installed and has a functioning serial or USB port.
- Apparel design software loaded into the computer according to the installation instructions.
- Printing media and ink cartridges that are within the guidelines stated under the *Operation* chapter.
- Depending on the communications setup, Ioline **FlexPlot** software is required if your CAD software does not create compatible files.



Note

In order to output to the FlexJet, your apparel design software must create plot files in **HPGL 7475** or **DM/PL** format. Alternatively, you can output markers using the **FlexPlot** software, included with the FlexJet. **FlexPlot** imports and converts a variety of file formats for output to the FlexJet.



Note

The Ioline **Control Center** and **FlexPlot** will only run on the Windows® 98/NT/2000/XP operating systems. Most design software provides drivers for Ioline printers. Contact Ioline customer service if you need assistance with drivers.

How The Ioline FlexJet Works

The FlexJet creates printed images through synchronized media and carriage motion. Files are sent to the printer from a computer or file server via a serial or USB connection.

When the printer receives a file, the electronic logic system translates the vector image into X-axis (paper motion) and Y-axis (carriage motion) instructions and uses digital feedback to ensure plot accuracy.

The FlexJet breaks the plot file into frame segments in order to plot long markers. The printer then rolls the frame segments onto a take-up shaft. The FlexJet can roll up to 600 yards onto the take-up shaft at a time.

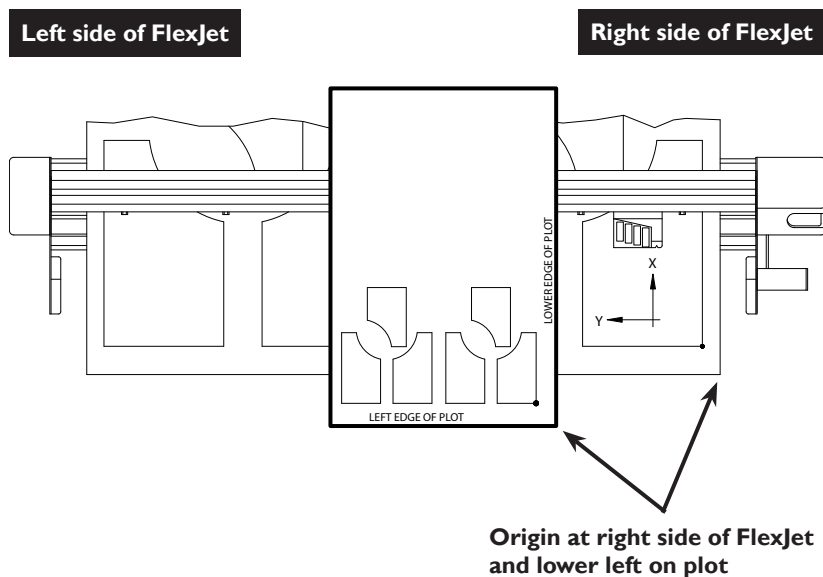


Figure 5. The X- and Y-axes and origin (top view, safety cover removed for clarity).



Note

In this manual the right and left side refers to the right and left side of the front of the FlexJet. Design software usually refers to the **Origin** (or Start Point) as “lower left” because it is the lower left corner of a plot. The plot is usually oriented in the printer rotated 90 degrees counter clockwise as shown in **Figure 5**. The lower left corner of the plot is physically on the right side of the printer.

An overview of the complete setup procedure is described in detail in the FlexJet Quick Start Guide. The FlexJet Set-up, Operating and Maintenance Video, provided on CD-ROM, also provides a helpful visual overview. Both materials are provided in the Accessory Kit.

FlexJet Assembly

Unpacking the Printer

Carefully remove the printer from the box and place it on a flat, stable surface. This procedure requires two people. Check the packing list to ensure that all of the accessories are present. (See the *FlexJet Quick Start Guide* for more information.) Save all packing materials and the box.

Assembling the Stand

Assemble and level the stand using the hardware included in the **Accessory Kit** and directions outlined in the *FlexJet Quick Start Guide*.

Attaching the Printer to the Stand

Attach the printer to the stand with the top bars resting in the notches in the stand legs. Use the hardware as indicated in the *FlexJet Quick Start Guide*.

Connect the FlexJet to the Computer: Overview

Connect the printer to your computer via serial cable (provided in the **Accessory Kit**). The corresponding serial port on your computer may be either a 9-pin or 25-pin male receptacle. If the computer has 25-pin serial ports, a 25- to 9-pin adapter is necessary.

Once connected, select the correct port and data rate in your apparel design software, **FlexPlot** and/or the **Control Center**. Consult the design software manual or the dealer for further information. Information on configuring **FlexPlot** and the **Control Center** follows in the **Operation** chapter.

CAUTION



Do not hold the printer chassis by the bottom edge of the end plates when attaching it to the stand. Fingers and hands might get pinched between the end plates and stand legs. Hold the gray metal top bars a few inches from the end plates when handling the head. (See **Figure 1**.)

CAUTION



Before connecting the FlexJet to your PC, make sure the computer and the printer both have the power turned off. Ioline recommends using a surge protector power strip for both the printer and the computer.

Cable Connections

When connecting the FlexJet to the computer by serial cable:

1. Make sure that power to the printer is off. Power is off when the switch is in the "0" position, and is turned on when placed in the "1" position.
2. Connect the supplied serial cable and power cord to the panel on the back right end cover of the printer. Lock the serial cable to the port on the printer with the thumb screws.

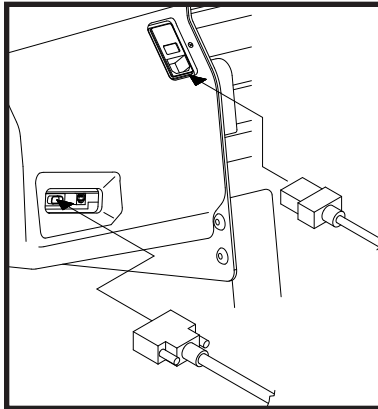


Figure 6. The serial cable and power cord plug into the sockets in the back of the right end cover.

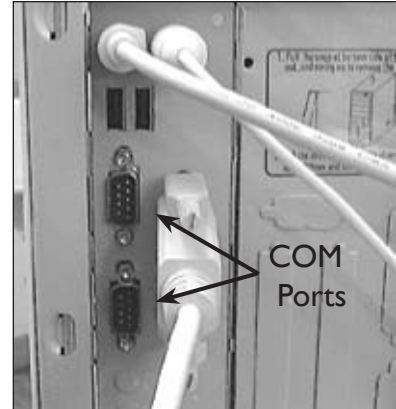


Figure 7. A PC typically has two 9-pin serial ports, **COM 1** and **COM 2**.

3. Plug the printer power cable into a wall socket or a surge protector.
4. Make sure that power is off to the computer.
5. Connect the serial cable to a 9-pin male serial port on the back of the computer. (If your computer has a 25-pin connector, acquire a 25-pin to 9-pin serial adapter to make the connection.) Tighten the thumbscrews.

Serial Configuration

It is critical that the FlexJet **Control Center**, **FlexPlot** software, and any other software that send data to the printer use the same COM port and baud rate that the FlexJet is using.

COM Port

A PC typically has two external 9-pin male serial connections. These ports are often listed in the system settings as **COM 1** and **COM 2**. Determine which port is connected to the FlexJet, then select that port in all the software as instructed in the respective software user guides. (See *Figure 8*.)

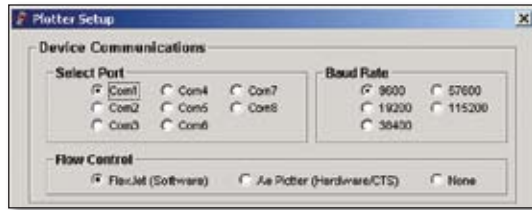


Figure 8. FlexPlot Serial Port set-up window.

Baud Rate

The serial port on the FlexJet has an adjustable baud rate. Available speeds are 9600, 19200, 38400, 57600, and 115200. The default is set at the factory to 38,400. The baud rate is adjustable in the **Control Center** in the **Communications>Settings** window.

Other Serial Port Settings

You may also need to set additional serial port settings, for instance, when you use a terminal program. The recommended configuration settings are:

Data Bits:	8
Parity:	None
Stop Bits:	1
Flow Control:	Software or Xon/Xoff

Software Setup Options

Ioline recommends using **FlexPlot** for marker making on the FlexJet. **FlexPlot** offers the most robust and flexible workflow available for creating output. It's especially useful when many file formats are used, a common situation for service bureaus. To set-up and learn how to use the software, see the *FlexPlot User Guide*.

The FlexJet is designed to work in many different production environments. The type of marker printing you do will often determine your preferred communication method. Two typical methods for sending markers are:

1. **Plot directly from the marker or design software to the FlexJet.** (See Figure 9.)

Unlike other marker printers, the FlexJet is capable of operating as a stand-alone device with no extra software running on the computer. This method works if your CAD software includes a driver for any Ioline product, such as the Ioline 600Ae or the Summit 2200. It will also work if the CAD software can create a compatible HPGL- or DM/PL- formatted file.

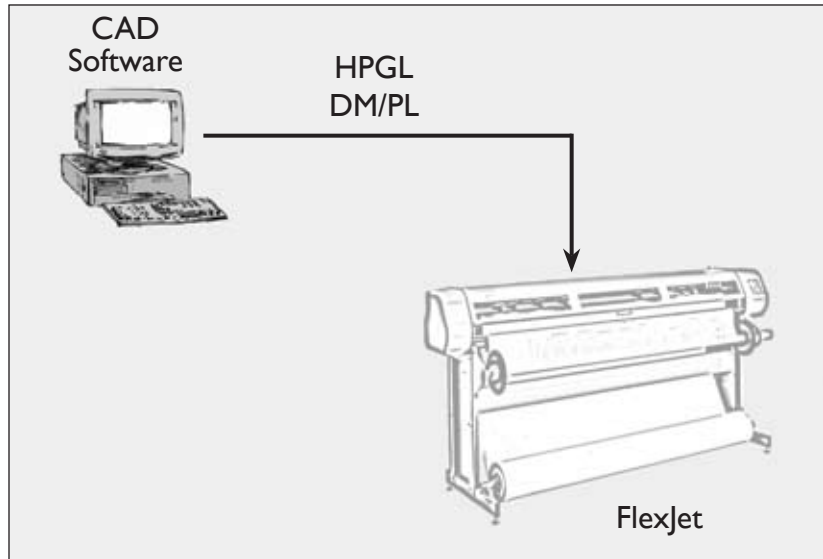


Figure 9. Workflow: output direct from CAD software (without FlexPlot).

2. **Use FlexPlot software to convert files before sending them to the FlexJet for output.**

The FlexJet includes the **FlexPlot** software which will convert many different files into a format that is compatible with the FlexJet. It also provides an advanced marker queue management system and other tools to optimize the performance of the printer.

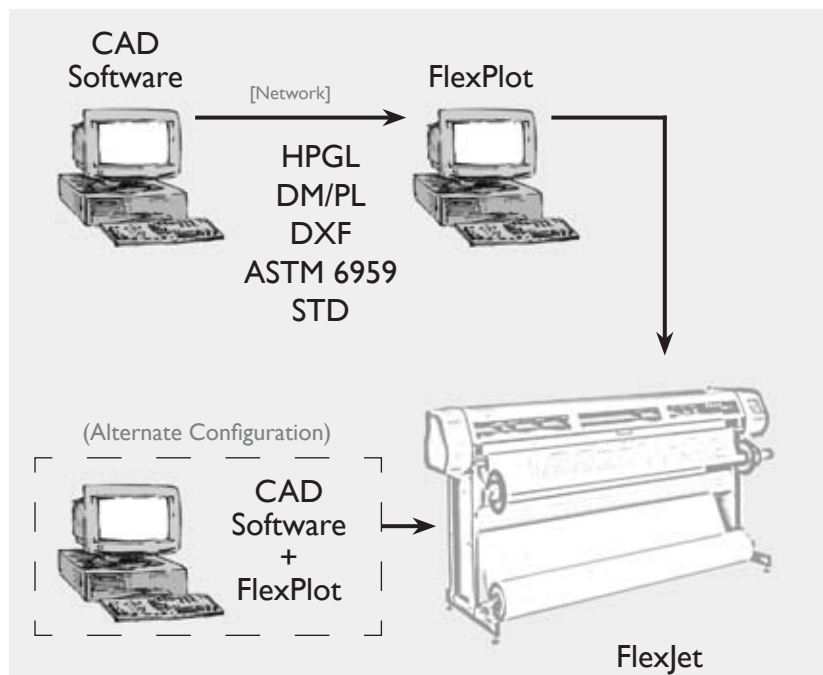


Figure 10. Workflow using **FlexPlot** for file conversion and output.

Power On

Turn on the computer and the printer to make sure they both work. The printer power switch is located next to the power cord on the back of the machine, behind the keypad. When the FlexJet is powered up, the carriage will move toward the left side of the machine, then return to the opposite side to park in the **Service Station**. The **OK** light will turn red and the **Square** light will turn green on the front panel after the start-up process has finished.

CAUTION



Keep hands and loose clothing away from all moving parts of the printer. Make sure the **Service Station** opening in the right end plate is not obstructed and that the stall latches are lowered.

Installing FlexPlot and the Control Center

The FlexJet includes two software interfaces: **FlexPlot** and the **Control Center**. **FlexPlot** will import and queue plot files from many design programs to optimize production operations. The **Control Center** is an interface for adjusting parameters to optimize printer performance. The printer comes with a CD-ROM which has Microsoft Windows® 98/NT/2000/XP versions of the programs as well as PDF user guides and the required Adobe® Acrobat® reader.

1. Power on the computer and Windows®.
2. Insert the Ioline CD-ROM into the CD-ROM drive (usually D:).
3. The installation program should start automatically. If it does not:
 - a. Select the **Start** button.
 - b. Choose **Run**.
 - c. Type **D:\IOSETUP** (substitute the correct letter if the CD-ROM drive letter is not **D:**) and Click **OK**.
4. Follow the instructions that appear on the screen.
5. The *FlexPlot User Guide* has details on using the **FlexPlot** software. In this manual, see the section *The FlexJet Control Center* for more details about the **Control Center** software.

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Keypad Controls

The keypad provides access to the main functions of the FlexJet.

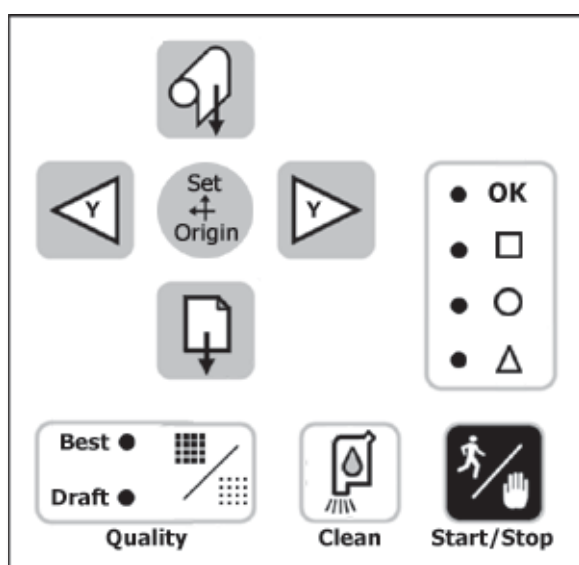


Figure 11. The Printer Keypad.

Start/Stop

The **Start/Stop** key toggles the FlexJet online and offline. If the **Start/Stop** key is pressed during printing, the **OK** light turns red and the machine will stop after it finishes printing the current scan. The **Arrow**, **Unroll** and **Paper Advance** keys are active when in **STOP** mode. When the **Start/Stop** key is pressed again, the printer enters **START** mode, the **OK** light turns green and printing resumes exactly where it stopped.

START mode OK = green

Arrow keys inoperable, printer *online* (ready to receive instructions).

STOP mode OK = red

Arrow keys operable, printer *offline* (not ready to receive instructions).

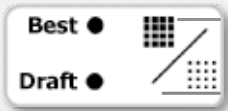




Clean

Runs the print heads through a cleaning cycle in the **Service Station**. Put the FlexJet in **STOP** mode and wait until the **OK** light turns red. Then press the **Clean** button. If the carriage is not already parked, it will return to the **Service Station**. After auto cleaning, the FlexJet will react differently when you put it in green light (**START**) mode, depending on what it was doing just prior to the cleaning:

FlexJet state before auto cleaning—e.g. what the printer is doing just before before it is put in STOP (red light) mode	FlexJet reaction when put in START mode after auto cleaning
Printing in START mode (OK light is green)	Resumes printing
Idle in START mode (OK light is green)	Stays parked and capped.
Idle, in STOP mode (OK light is red)	Stays parked and capped.



Quality

Switches between the **Best**—or dark (600 dpi)—line mode and **Draft** mode (300 dpi), which prints lighter and consumes less ink. You can change line quality while the FlexJet is printing.



Set Origin

The **Set Origin** key sets the initial origin or starting position for the marker. It's best to always set a new origin point after cycling power. To set a new origin, press **Start/Stop** until the **OK** light turns red (**STOP** mode). Use the **Arrow** keys to move the carriage so that the 'V' notch and red LED light are positioned over the desired starting point. Press the **Set Origin** key. The **OK** light will turn green, indicating the printer is ready to accept plot files. (See *Figure 12*.)

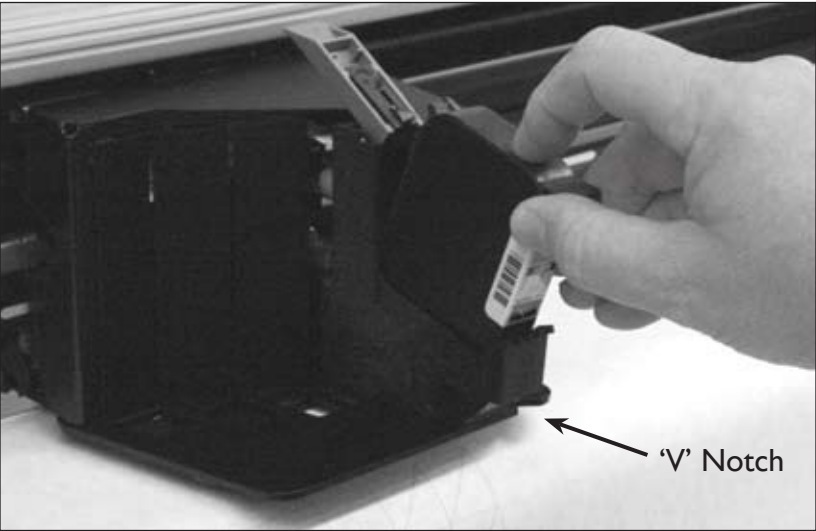


Figure 12. The **Set Origin** key sets the marker origin point directly below the top of the notched 'V' on the carriage base—located on the right side, near the red LED light.

Note

Apparel design software usually refers to the origin as “lower left” because it is the lower left corner of a marker. Because the plot is usually oriented as shown in *Figure 5*, it is physically on the right side of the printer.

Arrow Keys

Pressing the **Arrow** keys moves the carriage left or right. The **Arrow** keys are only active in **STOP** mode (see **Start/Stop**), when the **OK** light is red.

Page Advance

Pressing this button advances the paper in small increments. This is useful if a plot was removed from the printer and you need a paper leader to tape to the take-up shaft. The **Page Advance** key is only active in **STOP** mode (when the **OK** light is red).

Unroll

Unroll Material – Press the **Start/Stop** button until the **OK** light turns red. Press and release the **Unroll** button. The printer will unroll a short segment of paper from the take-up shaft.

Automatic Unroll – Press the **Start/Stop** button until the keypad light turns red. Press and hold the **Unroll** button. The printer will automatically unroll paper. To cancel **Automatic** mode, press the **Start/Stop** key again.

Special Key Combinations

Roll Up

Use this function to roll material back onto the take-up shaft. Press and hold the **Unroll** and **Right Arrow** buttons at the same time. The rolling will continue until the dancer bar reaches the optical sensor. The **Roll Up** key is only active in **STOP** mode (when the **OK** light is red).

Reset Serial Port Baud Rate

This key combination will restore the serial port baud rate to the default speed of 38,400. This is useful for diagnostic testing of the communication system. Turn power off. Press and hold the **Page Advance** key as you turn power on again. Continue holding the key down until the **OK** light turns red and the **Square** light turns green.

Restore Factory Default Settings

This function replaces settings that are not working properly and can be used when manual calibration is unsuccessful. This key combination will restore all calibration values to the factory defaults. Turn power off. Press and hold the **Unroll** key as you power up again. Continue holding the key down until the **OK** light turns red and the **Square** light turns green.



Note

For more details on removing plotted markers from the take-up shaft see **Removing Markers from the Take-Up Shaft** later in this chapter.



**Note**

To avoid communication port conflicts, do not simultaneously run more than one application that communicates with the printer.

The FlexJet Control Center

Overview

The FlexJet **Control Center** is a utility program that does two things:

- Allows you to adjust settings to tailor output (e.g. scale, line width) from the computer.
- Provides an interface to send completed files to the printer.

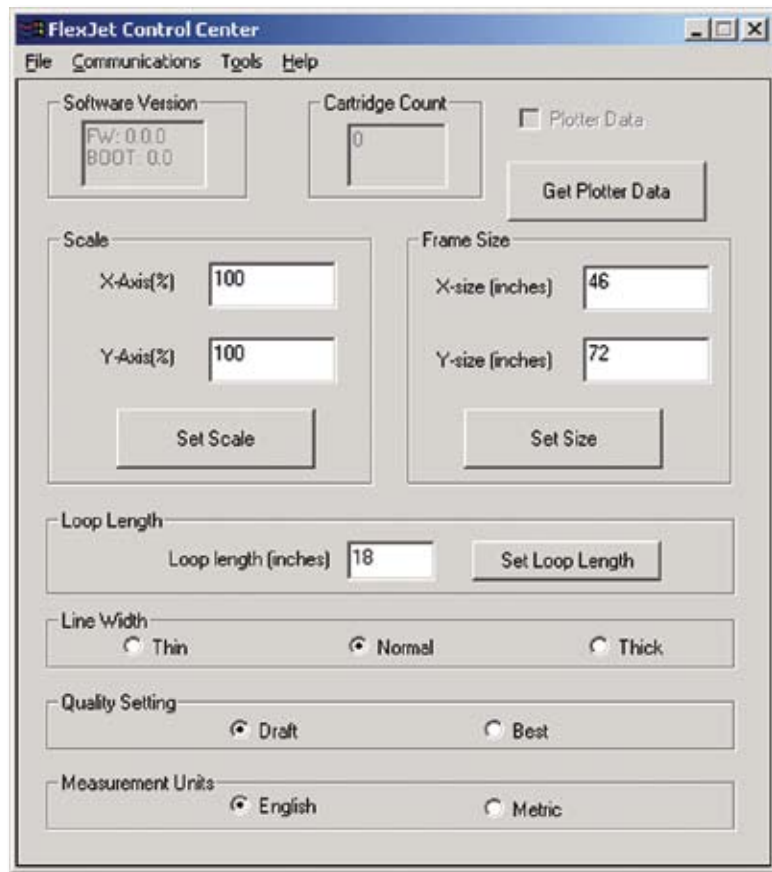


Figure 13. FlexJet Control Center Main Menu.

Changing System Settings

A variety of settings are adjustable to fit specific needs:

- Make sure the printer power is on and that the initialization process is complete. The carriage will park, the keypad **OK** light will turn red and the **Square** light will turn green.
- The **Screen Menu** displays the primary settings that are adjustable. The **Menu Bar** contains utilities for setting up the **Control Center** and calibrating the FlexJet.
- Changes only take effect after one of the **Send** buttons is pushed.

Control Center Menu Bar Features

File

Download Firmware	Allows the user to download the latest firmware version for the FlexJet. <i>See the section Downloading Firmware in the Routine Maintenance chapter for more information.</i>
Send Plot File	Print a PLT or PLX file.
Exit	Exit the Control Center .

Communications

Settings	Select the COM port and baud rate to match the printer.
Send Command	Permits advanced users to manually enter commands.
Automatic Buffer Closing	Disables Buffer Close Timer . Improves communications on some systems.

Tools

Aux Sensor	Controls the bottom Paper Out sensor on new FlexJets or the Cover Sensor on old FlexJets.
Cartridge Calibration	Displays tools to adjust print cartridge alignment. <i>See Routine Maintenance for more details.</i>
Size Calibration	Allows adjustment of the size calibration settings. <i>See Routine Maintenance for more details.</i>
About Your FlexJet	Displays license information for machines with upgraded print heads.
FlexJet Licensing	Sets the license key code to enable inactive print heads in machines pre-wired for expansion. Requires firmware version 368.x or greater.

Help

About	Displays Control Center version information.
-------	---

Control Center Menu Options

Software Version

Displays the current installed firmware and boot loader version.

Cartridge Count

Displays how many cartridges are in active use by the printer.

Get Plotter Data

Reads and displays the current input box settings stored in the FlexJet.

Plotter Data (check box)

Indicates when the displayed settings were successfully downloaded from the printer. If this box is unchecked, the **Control Center** was unable to connect with the FlexJet and cannot display current settings. Check the connections, baud rate and COM port. Press the **Get Plotter Data** button to attempt to download settings if the process failed during startup.

Scale

The printer scale ranges from 1% to 999%. The factory default **Scale** is 100%. A scale set to 50% prints at half size. Changes do not take effect until the **Set Scale** button is pressed. Note: Both X- and Y-axes are set independently.

Frame Size

Most design software sends long plots to printers by breaking them into smaller pieces called *frames*. In general, design software does this automatically and adjusts the **Frame Size** in the printer to match. The **Frame Size** setting establishes clipping limits for each data frame. If the printed size of a plot frame exceeds the frame size set in the FlexJet, the excess is clipped or thrown away. (If the plot is clipped, try increasing the **Frame Size** manually.) The factory-set X-axis (paper direction) frame size is 46-in (116.8-cm), maximum is 21600-in (54,864-cm). Default and maximum Y-axis (carriage direction) frame size is 72-in (182.9-cm).

Loop Length

Controls the length of the take-up loop. Shortening the loop may reduce paper tearing but runs the take-up motor more often.

Line Width

Controls the weight of the plotted line using line width. Three levels are available; **Thin**, **Normal**, and **Thick**. Thin lines use less ink and make fine details like Asian text and small pieces easier to see. Thick lines use more ink to produce higher contrast lines.

Used in conjunction with the **Quality Setting** (*see below*), the FlexJet provides six options for output quality, to enable you to produce clearly visible lines using the least possible amount of ink.

Quality Setting

Choose **Draft** or **Best** to control line density. **Draft** mode uses 300 DPI. **Best** mode uses 600 DPI. A lower DPI setting uses less ink by creating a fainter line. Higher DPI uses more ink but makes a darker line. Use this setting in conjunction with the **Line Width** (*see above*) to find a balance between saving ink and making clearly visible lines.

Measurement Units

Choose between English or Metric units for settings display.

Consumables

Paper

Ioline recommends 27 to 35 pound recycled or bond paper, 36- to 74-in (91- to 188-cm) wide. The feed system supports rolls up to 600 yds long.



Figure 14. The Hewlett-Packard 51645A ('45' cartridges) are widely available.

Ink

The Ioline FlexJet requires Hewlett-Packard 51645A or '45' cartridges.

Guidelines for Installing a Cartridge

1. With the printer in **STOP** mode (red **OK** light), press the left arrow key to move the carriage out onto the platen until all cartridge stalls are exposed.
2. Raise the safety cover. Open the blue stall latch and remove the old cartridge if one is present. Squeeze the handle between your fingers and pull forward, then up. Repeat for each cartridge.
3. Insert the new cartridge with the print head pointing down toward the rear of stall and at a slight outward angle. Press firmly while rotating the top of cartridge toward the back of the stall until it stops in an upright position. (*See Figure 15.*)

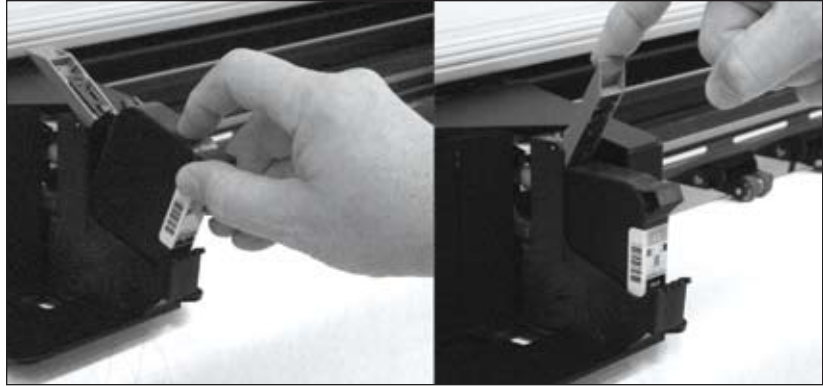


Figure 15. Insert ink cartridges at an angle into the cartridge bay. Lock in place with the stall latch.

4. Close the stall latch. If the cartridge is inserted properly, the latch will snap shut and securely hold the cartridge. Do not force the latch. If the latch does not close properly, remove and reinsert the cartridge.

Printing a Marker

Overview

The basic steps required to print a marker on the FlexJet are:

1. Turn the printer and computer power on.
2. Load paper.
3. Install cartridges in the stalls.
4. Set an origin.
5. Start **FlexPlot** or your design application.*
6. Send marker/plot files.

These steps are outlined in the next several sections. In most cases the design files are sent to the printer from **FlexPlot** or the design application. If necessary, use the Ioline **Control Center** to send design files or adjust settings.

General Guidelines

1. Good paper loading makes good plots. Follow loading instructions carefully.
2. Ensure that the paper roll is centered on the feed shaft by aligning the paper hub with the guideline marks.
3. Keep the plastic feed shaft block clean and well lubricated.
4. Use the **FlexPlot** software for optimal file management and printing throughput.

* Refer to the FlexPlot User Guide for information on set-up and configuration.

Power On

Turn on power to the computer and to the printer. The printer power switch is located next to the power cord on the back. When the power comes on, the carriage will move left across the platen then return and stop on the right side. The front panel **OK** light will turn red and the **Square** light will turn green when the printer is ready.

CAUTION



Keep hands and loose clothing away from all moving parts.

Loading Paper

1. Before loading a new paper roll always make sure the drive shaft is clean. See the *Routine Maintenance* section for more details.
2. Place a paper hub in each end of the paper roll using a rubber mallet.
3. Slide the feed shaft through the paper hubs and the paper roll. If a paper hub falls out, press it firmly back into the end of the paper roll and reseal it with a rubber mallet.
4. **This step is very important.** Center the paper roll on the feed shaft by aligning the hubs with the black markings on the feed shaft. Make sure the hubs remain securely in place.

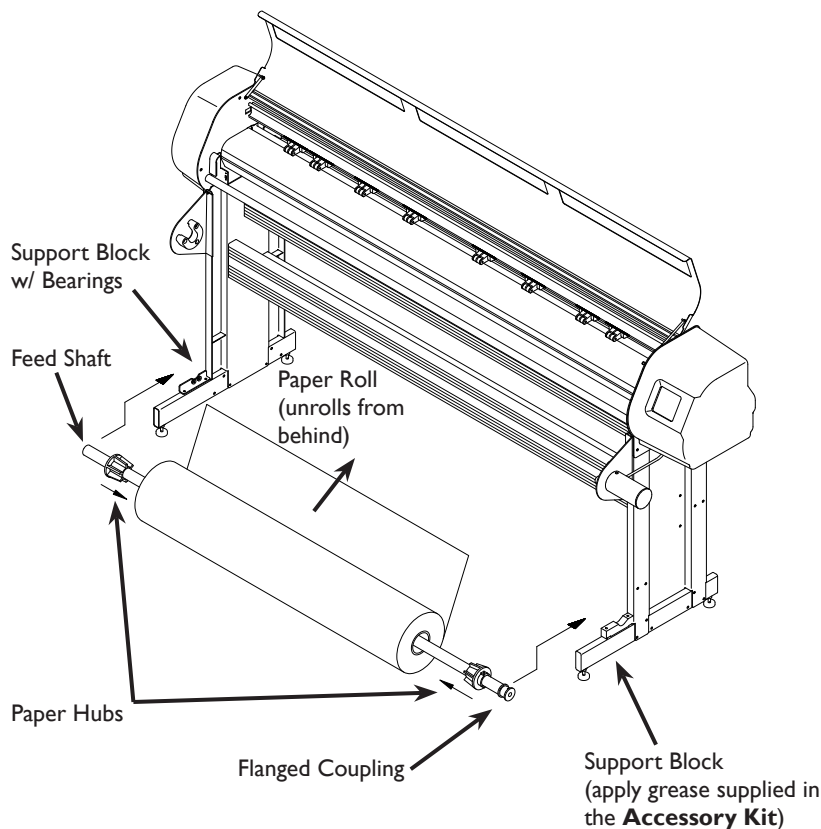


Figure 16. Installing the feed shaft.



Hint

The FlexJet Set-up, Operating and Maintenance Video, provided on CD-ROM in the **Accessory Kit**, provides a helpful visual overview.



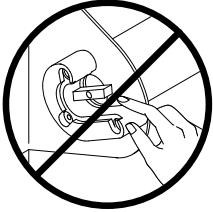
Note

Make sure the paper unrolls from behind and towards the printer.

CAUTION

Never touch the take-up key or flanged coupling while they are rotating.

Serious personal injury could result. Turn power off first.



5. Use the supplied hex wrench to tighten both screws on each paper hub.
6. Check that the right support block is clear of debris and apply a light coating of white lithium grease (supplied in the **Accessory Kit**.)
7. Lift the feed shaft ends, one at a time, into the support blocks.

Installing the Take-up Shaft

1. If the take-up shaft has plotted markers on it, remove them. See *Removing Markers from the Take-up Shaft* later in this chapter.
2. Turn the FlexJet on (the switch is on the back of the left cover.)
3. Use the keypad Unroll key to rotate the take-up key until it is oriented perpendicular to the support block opening as shown in *Figure 17*.
4. Put the take-up shaft into the front support blocks with the flanged coupling at the right (keypad) end. Rotate the shaft until the slot in the flanged coupling is aligned with the take-up key. When the shaft slot and the key are aligned, push the take-up shaft into place until it is seated in the support block.

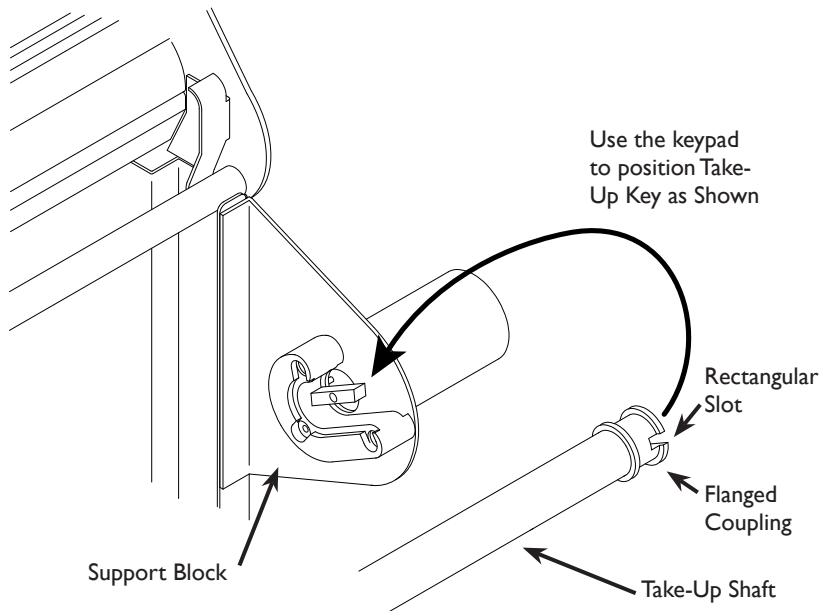


Figure 17. Installing the take-up shaft in the support blocks.

Feeding Paper

Figure 18 represents the proper paper path. The diagram on the left shows the paper after it is inserted properly and taped to the take-up shaft. The figure on the right shows the result after the dancer bars are inserted.

1. Remove any printed markers from the take-up shaft and make sure the carriage is parked in the **Service Station** before feeding the paper. (To park the carriage, press **Start/Stop**. Wait for the **OK** light to turn red and press the **Clean** button.)
2. If the pinchwheels are lowered, raise them by pushing the pinchwheel lever away from the machine.
3. Pull a long leader of paper off of the paper roll and insert it through the stand, behind the plotting head, over the rear top bar, and between the platen and pinchwheels.
4. Temporarily lock the paper in place by pulling the pinchwheel lever toward the machine to lower the pinchwheels.

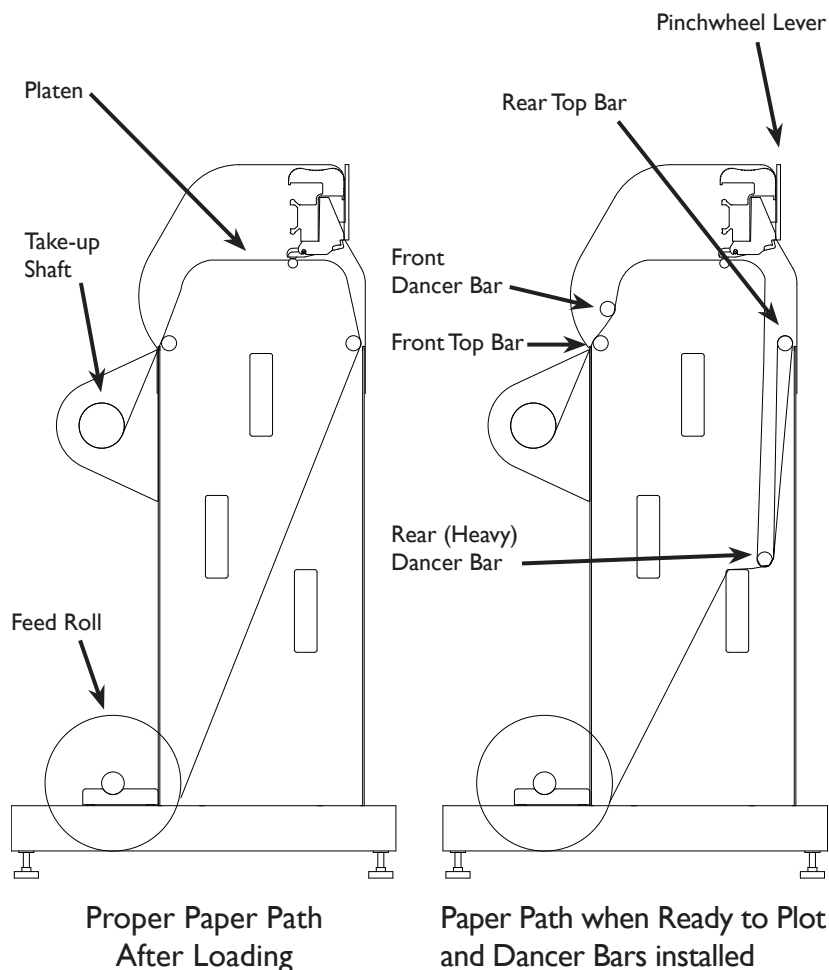


Figure 18. The correct paper feeding path on the Ioline FlexJet Printer.



Note

When installing or retaping paper, remove the rear and front dancer bars and set them aside.

Tape Paper to the Take-up Shaft

1. Stand in front of the machine.
2. Place 3 short pieces of masking tape within easy reach on the safety cover. (See *Figure 19.*)
3. Holding the edge of the paper with one hand, use your free hand to lower the pinchwheel lever to raise the pinchwheels.
4. Grasp the front edge of the paper with both hands and pull 20-in (51-cm) of paper over the platen and gray top bar and under the take-up shaft. (See *Figure 18* for the proper paper path.)
5. Add tension to the feed roll by applying gentle pressure using the bottom of your foot.
6. To align the paper, gently pull it forward and side to side until the tension feels even.
7. Press and hold the paper on the center of the platen with your left hand, then lower the pinchwheels to lock the paper in place.
8. Attach the paper to the take-up shaft in the center and 2-in (5-cm) from each end with the tape.

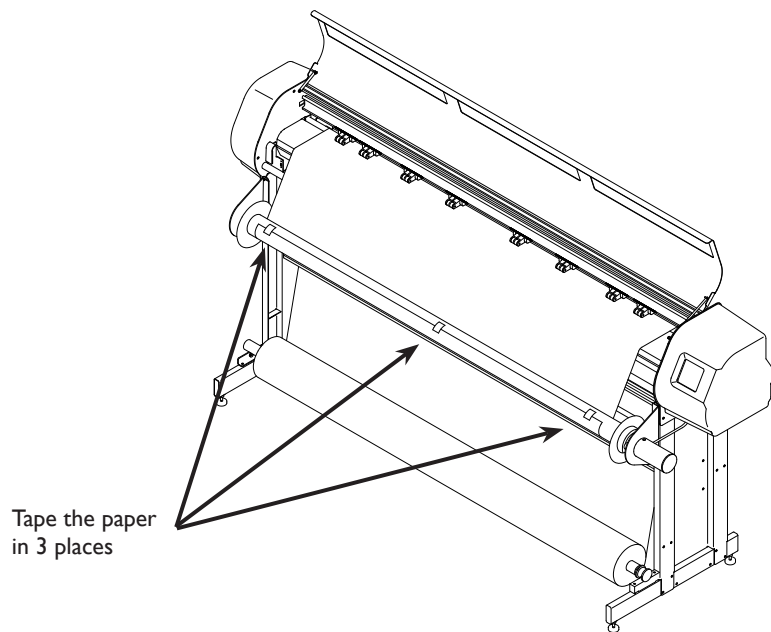


Figure 19. Taping the paper to the take-up shaft.

Positioning the Pinchwheels

Pinchwheel position should correspond to paper size. Always place two pinchwheels at the outside edges and evenly distribute the others.

1. Ensure that the paper is loaded as described in the previous steps.
2. Press and hold the paper on the center of the platen with your left hand, then raise the pinchwheels by pushing the pinchwheel lever away from the machine with your right hand.

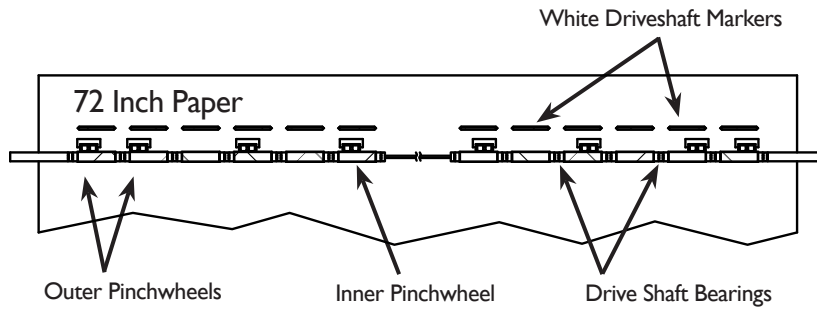


Figure 20. Positioning the pinchwheels for 72-in (183-cm) paper.

3. Make sure that the paper roll is centered on the feed shaft.
4. Move the pinchwheels into their proper positions over a tread and under the white markers on the traverse rail. (See *Figure 20*.) **Do not place pinchwheels over drive shaft bearings.**
5. Lower the pinchwheels.

Insert the Dancer Bars

1. Lower the pinchwheels by pulling the lever toward the machine.
2. Hold the paper in place over the rear top bar and insert the rear (heavy, gray) dancer bar into the rear dancer bar channel. Apply gentle pressure to control the paper feed as gravity pulls the heavy bar into the channel. See *Figure 21*.
3. Insert the front dancer bar into the front dancer bar channels.

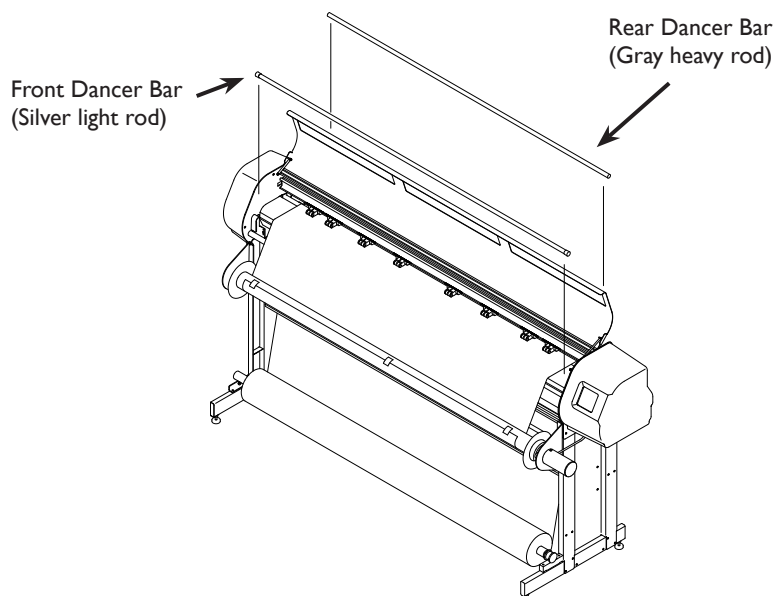


Figure 21. Inserting the dancer bars.



Note

Ensure that the paper roll is centered on the feed shaft.

Set an Origin

1. Ensure that cartridges are installed in the carriage stall(s). (See *Guidelines for Installing a Cartridge* earlier in this chapter.)
2. Close the cover and turn on the power. After a brief pause, the carriage will glide to the left end plate, then return for a cleaning in the **Service Station**. When the initial start-up process completes, the **OK** light will turn red and the **Square** light will turn green.
3. Press the **Left Arrow** key to position the carriage so that the tip of the small 'V' notch in the base is over the desired starting point of the plot. Close the safety cover.
4. Press the **Set Origin** key. The **OK** light will turn green. The printer is ready to plot.

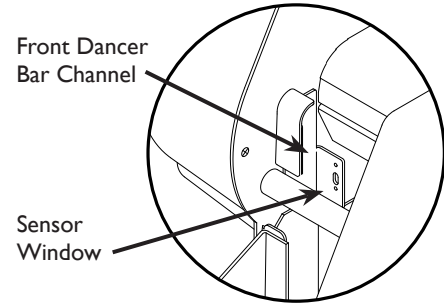


Figure 22. Front Dancer Bar Channel.

Sending Plot Files

Send plot files to the printer using **FlexPlot** or design software. Make sure the power is on and that the paper is loaded as previously described. Also, be sure that a new origin is set with the **Set Origin** keypad button and that the printer is in **Start** mode (green light).

From **FlexPlot**:*

1. Choose input file type and location then double click on the file.
2. Conversion will occur and the **Send to Queue** button is activated. Press this button to add the file to the queue.
3. Repeat steps 1 to 2 until the Queue contains all files you wish to print.
4. Press the **Send** button.

* See the **FlexPlot User Guide** or your design application user guide for information on how to send files to the printer.

CAUTION



Do not pull paper tight between the drive shaft and the take-up shaft while printing is paused. Do not turn the feed roll or take-up roll by hand while printing is paused.

Pausing a Marker Plot

1. Pause a plot by pressing the **Start/Stop** key.
2. The **OK** light will change from green to red. The FlexJet will finish printing the current scan, then pause.
3. Once the printing has paused, you may use the keypad keys to move the carriage, paper, and take-up shaft. When the **Start/Stop** key is pressed again (**OK** light changes from red to green) the printer will begin printing again where it left off.

Canceling a Marker Plot

1. Press the **Start/Stop** key to place the printer in **STOP** mode (red light). The FlexJet will finish printing the current scan and pause.
2. To stop the computer from sending plot files to the printer, click the **Abort** button in **FlexPlot**.
3. Use the keypad **Arrow** keys to position the carriage for the start of a new plot file as described earlier.
4. Press the **Set Origin** key to ready the printer for the next plot file.

Removing Markers from the Take-up Shaft

1. Press **Start/Stop** until the **OK** light changes to red (**STOP** mode).
2. Wait for the plotting to halt, then open the safety cover.
3. Remove the front dancer bar. Place it in the small notches in the brackets in the front cover hinges for storage.
4. Cut the paper with the supplied cutting tool, using the groove in the front of the platen as a guide.
5. Use one of the following methods to remove completed markers:

Method 1: Unroll with the take-up shaft in place

- a. With the power off, rotate the take-up shaft by hand until the rectangular opening in the flanged coupling is perpendicular to the opening in the support block (see *Figure 17*).
- b. Remove the shaft from the support blocks.
- c. When unwound, the plotted image faces up, permitting markers to be unrolled onto the cutting table with the take-up shaft in place.

Method 2: Manual unroll with the *Unroll* key

- a. Press the **Unroll** key to unroll full markers in short steps.
- b. Cut the marker free from the take-up shaft. Reattach the paper to the take-up shaft with masking tape following the steps outlined under the section *Reattach Paper to the Take-up Shaft* later in this chapter before continuing printing.

Method 3: Automatic Unroll with the *Unroll* Key

- a. Press and hold the **Unroll** key for 3 seconds; The take-up shaft will automatically unroll.
- b. Cancel automatic unroll at any time by pressing **Start/Stop**.

Method 4: Remove the shaft and unroll away from the machine

- a. Cut the marker free, wind it manually or automatically with the take-up motor, and remove the take-up shaft from the support blocks.



Note

Except when the feed roll is changed, it is best to leave the pinchwheels down when removing completed markers from the take-up roll. Leaving the pinchwheels down will help keep the paper aligned with the feed roll and reduce the time between printing operations.

CAUTION



The take-up shaft is very heavy when many plots have been rolled up. It is recommended that two or more people remove a full take-up roll from the machine.



Hint

An alternate method to ease removal of markers is to slide a 3-in cardboard core over the take-up shaft then tape paper to it. The cardboard core will rotate slowly at first—and may not raise the front dancer bar—but will still roll up completed markers. Simply slide the core off the take up shaft when plotting is complete.

Manually Freeing the Take-up Shaft

Use this method to remove the take-up shaft from the completed roll without having to unroll the markers.

1. Tape the loose end of the roll down so that it cannot flap freely.
2. Rotate the take-up shaft by hand until the rectangular opening in the flanged coupling is perpendicular to the opening in the support block (see *Figure 17*). Remove the shaft.
3. Stand the roll on end with the flanged coupling pointing up. Rotate the take-up shaft counter clockwise (opposite to the direction that the paper was rolled on the machine. (See *Figure 23*.)
4. The larger the roll, the more rotations are required to free the shaft. When the shaft freely rotates, lay the roll on the ground.
5. Continue to twist the shaft counter clockwise while pulling it out of the paper roll until it is free.

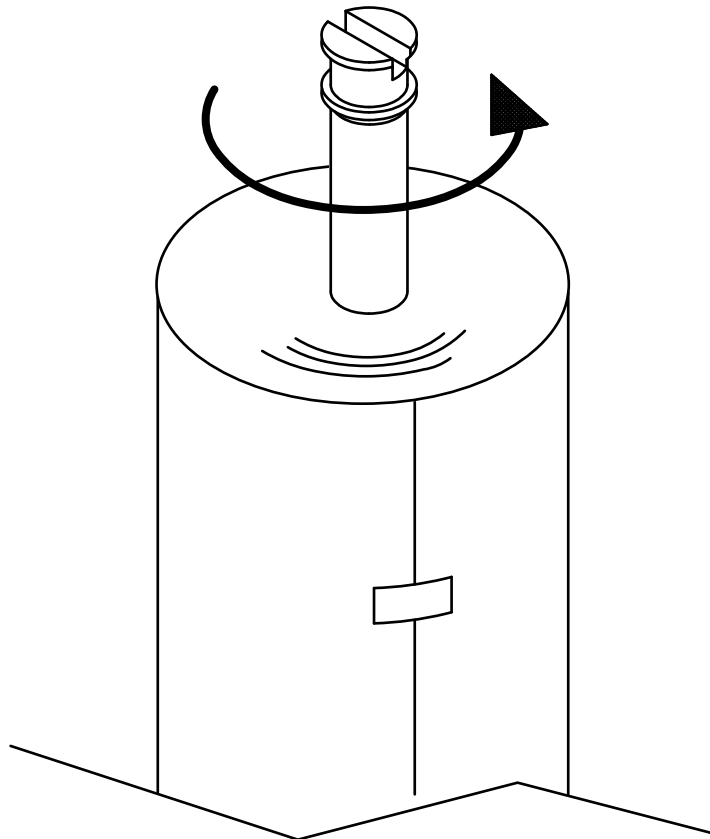


Figure 23. Manually freeing the take-up shaft.

Automatically Freeing the Take-Up Shaft

Like the manual method, this method removes the take-up shaft from the completed roll without having to unroll the markers. The only difference is the use of the take-up motor.

1. Tape the loose end of the roll down so that it cannot flap free.
2. While one person lifts from the bottom and holds the paper roll still, press the **Unroll** key to rotate the take-up shaft opposite to the direction that the paper was rolled on the machine.
3. The larger the roll, the more rotations are required to free the shaft. When the shaft freely rotates in the roll, stop turning the take-up shaft. If the printer jams and the motor does not turn then do not unwind the roll with the motor. (See *Manually Freeing the Take-Up Shaft* above.)
4. Rotate the take-up shaft by hand until the rectangular opening in the flanged coupling is perpendicular to the opening in the support block (see *Figure 17*). Remove the shaft and lay it on the ground.
5. Continue to twist the shaft counter clockwise while pulling it out of the paper roll until it is free.

Reattach Paper to the Take-up Shaft

1. Use the **Page Advance** key to drive enough paper forward to drape over the gray top bar and wrap under and around the take-up shaft.
2. Guide the paper over the gray top bar as it is pulled forward.
3. Make sure the paper wraps under the take-up shaft.
4. Follow the guidelines described in *Taping Paper to the Take-Up Shaft*.
5. Make sure the silver front dancer bar is below the sensor shown in *Figure 22*.

CAUTION



The take-up shaft is very heavy when many plots have been rolled up. It is recommended that two or more people remove the plotted paper roll from the machine.



Note

Except when the feed roll is changed, it is best to leave the pinchwheels down when removing completed markers from the take-up roll. Leaving the pinchwheels down will help keep the paper aligned with the feed roll and reduce the time between printing operations.

CAUTION

If the paper bubbles or wrinkles while it flows over the platen surface, the carriage might catch the edge of the paper and tear it, causing a paper jam. Make sure that the paper is smoothly collecting on the floor to avoid paper jams.

**Note**

The front dancer bar is not needed when plotting to the floor.

Printing to the Floor

With careful setup and constant supervision, the FlexJet will print markers directly onto the floor. This method is NOT intended for printing long markers or unattended printing. Ioline recommends that only markers 10 yards and shorter are printed with this method.

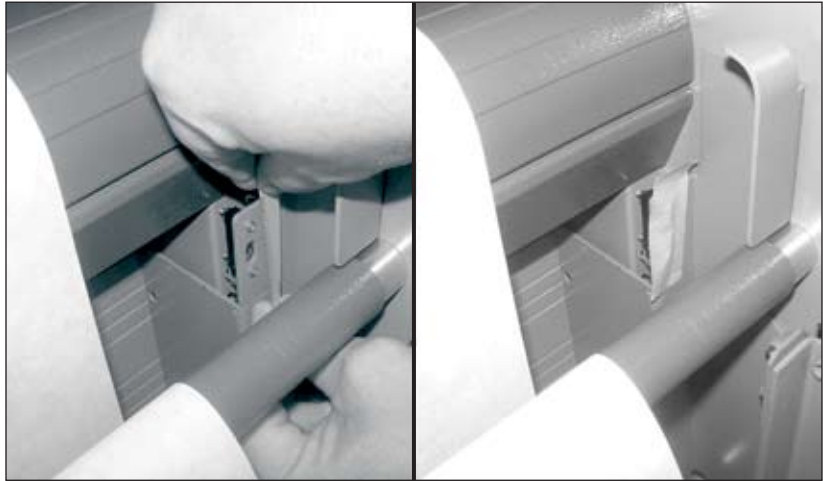


Figure 24. Before printing to the floor, place tape over the front take-up bar sensor.

1. With FlexJet power off, place a piece of tape over the front take-up bar sensor as shown in *Figure 24*.
2. Use the paper path diagram to thread the paper on the front of the machine. It should drape over the front top bar AND the empty take-up shaft.
3. Set an origin normally and begin plotting. Make sure that the paper piles smoothly onto the floor. If it bunches up, it may catch on the moving carriage and tear.

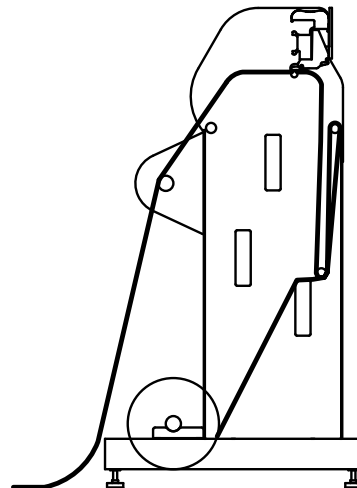


Figure 25. Paper path for printing to the floor.

Cleaning the Drive Shaft

Clean the drive shaft regularly to assure accurate plotting:

1. Turn off the printer and disconnect the power cord.
2. Gently remove any accumulated dust and residue with the stiff non-metal bristle brush provided in the **Accessory Kit**.



Figure 26. Cleaning the Drive Shaft.

Cleaning the Platen and Traverse

Dust and paper residue accumulate on the platen and traverse. Under regular use, clean every two weeks:

1. Turn off power to the printer.
2. Dampen a lint-free cloth with isopropyl (pharmacy) alcohol and gently wipe the platen and traverse rails until accumulated residue is removed.

CAUTION



Warning: Do not use water, brushes with metal bristles or solvents (except isopropyl—pharmacy—alcohol) to clean the printer. Keep the drive shaft bearings free of all liquids.



Hint

Use antistatic spray instead of isopropyl alcohol to clean platen and traverse, if desired.

CAUTION

Never touch the take-up key or flanged coupling while they are rotating.

Serious personal injury could result. Turn power off first.



Cleaning the Support Blocks

When dust and paper residue will accumulate on the take-up and feed shaft support blocks, frequent feed shaft jams can occur. Perform this procedure when debris inhibits easy rotation of the shaft.

1. Turn off power to the printer.
2. Remove the feed shaft and the take-up shaft.
3. Dampen a lint-free cloth with isopropyl (pharmacy) alcohol and gently wipe the plastic support blocks until accumulated residue is removed.
4. Apply a light coating of grease to the plastic feed shaft support block. White Lithium grease is supplied with the printer. 3-in-1™ brand oil is also a very good lubricant for the feed block.
5. Wipe down both ends of the feed and take-up shafts before reinstalling them.

Size Calibration

Over time, the printer may require calibration to account for normal wear. Calibration adjusts the output to match design intent.

Prepare the Printer (See the **Operation** chapter)

1. Load the printer with, at minimum, 46-in wide paper.
2. Install ink cartridges.
3. Using the **Arrow** keys, move the carriage so that the carriage notch is positioned about 1 inch from the right edge of the paper.
4. Press the **Set Origin** key to put the printer in **START** (green light) mode.

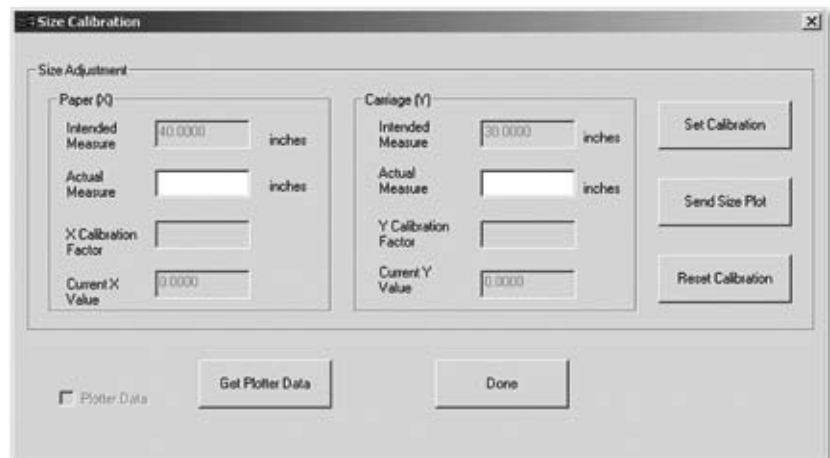


Figure 27. Calibration screen in **Control Center**.

**Note**

The Scale command does not effect calibration values.

Use the Control Center to Gather the Calibration Data

1. Open the FlexJet **Control Center** program.
2. Select **Tools>Size Calibration** from the **Menu Bar**. The window in *Figure 27* will appear:
3. Press the **Send Size Plot** button to print the factory stored calibration box. The printer will print a box that is 40" (102-cm) long on the X-axis and 30-in (76-cm) wide on the Y-axis.

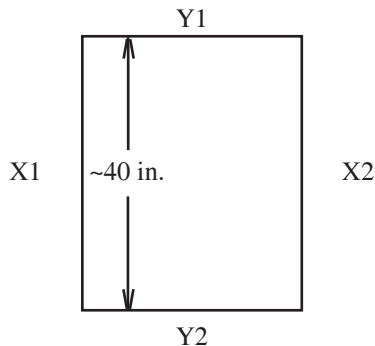


Figure 28. The Calibration box and measurements.

4. Precisely measure both sides (X) and the top and bottom (Y) of the box and record the results. Better accuracy in measurement equals better calibration.
5. Take the average of the horizontal (Y) values by adding them together and dividing by 2. Repeat this procedure for the vertical (X) values.

Example:

If $X1 = 39.750\text{-in}$ and $X2 = 39.700\text{-in}$

The sum is 79.450-in ($39.750\text{-in} + 39.700\text{-in} = 79.450\text{-in}$)

The average is 39.725-in ($79.450\text{-in} / 2 = 39.725\text{-in}$)

The X calibration value is the average, 39.725-in

Enter the Calibration Data:

1. Enter the measured values in the boxes in the **Calibration** window. Make sure the printer is in **START** (green light) mode. Select the **Set Calibration** button.
2. The Control Center will send the calibration values to the printer and the new **Calibration Setting** will be displayed in the boxes in the window pictured in *Figure 27*.
3. Click on **Done** when finished.



Note

Only use **Reset Calibration** to restore original factory calibration settings.



Hint

The **Get Plotter Data** button will read the stored calibration settings from the printer and display them in the **Factor** windows.



Hint

The factory-set calibration values are written on a small sticker inside the **Service Station** (See *Figure 34*). To view them, turn off the power, manually pull the carriage out over the platen and peer through the opening in the right end cover. You'll see a white sticker in the back.

Cartridge Calibration

There are three types of adjustments associated with the ink cartridges. Most line quality issues are resolved by adjusting these values.

- **Cartridge Alignment** aligns each individual ink cartridge relative to one another.
- **Motion Adjustment** aligns scans in the direction of carriage travel.
- **Frame Gap** aligns scans in the direction of paper movement.



Figure 29. Cartridge calibration window.

Prepare the Printer

1. Load the printer with paper that is a minimum of 46-in wide. (Follow the loading instructions under the *Operation* chapter.) Install cartridges.
2. Move the carriage using the **Arrow** keys so that the carriage notch is over the paper and roughly one inch from the right paper edge.
3. Put the printer in **START** (green light) mode by pressing the **Set Origin** key. (See the *Operation* chapter for more details on preparing to plot.)
4. Start the FlexJet **Control Center** software. Ensure that there are no errors when the program tries to communicate with the printer. If errors occur, check the cables and ensure that the correct port number and baud rate are selected. (See *Connect the FlexJet to the Computer: Overview* in the *Installation* chapter for information on serial port connections.)



Note

Cartridge alignment is not necessary for FlexJets with a single activated cartridge stall.

Cartridge Alignment

1. Enter **-50** in the *Frame Gap Window* to add a 0.05-in gap after each scan.
2. Press **Select Alignment Plot**.
3. Browse to the *c:\Ioline\Calibration* folder. Select the *40X8.plt* test file.
4. The boxes in the **Cartridge Alignment** window correspond to the print cartridges. The cartridge on the side closest to the keypad is **Cartridge 1**. This cartridge also prints closest to the front of the machine. The first 0.5-in of each scan is from the first cartridge; the second 0.5-in is from the second cartridge.
5. Changing the values will move the line closer or further from the line made by the previous cartridge. Adding 1 to the adjustment moves the cartridge alignment about $\frac{1}{2}$ line width either direction.
6. Adjust the values, then press the **Set Alignment** button.

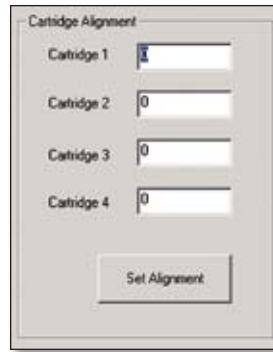


Figure 30. The Cartridge Alignment Box.

Example (using the first cartridge as reference):

- a. Lines from the second cartridge must shift one line width (2 units) left to align with the first cartridge.
 - b. Subtract 2 from the number displayed in the box (negative numbers are okay) and enter it in the **Cartridge 2** window.
 - c. Press the **Set Alignment** button.
 - d. Resend the *40X8.plt* test file to ensure the results are satisfactory. Repeat until the results are correct.
7. Perform the **Frame Gap** adjustment detailed later in this chapter to reset the **Frame Gap**.

Motion Adjust (Carriage Scan Alignment)

1. Press **Select Alignment Plot**.
2. Browse to the *c:\Ioline\Calibration* folder. Select the *40X8.plt* test file.
3. The **Motion Adjust** box has one number for adjustment. The default value is 0.
4. Changing the values affects the next scan, created when moving from left to right.
5. Press the **Set Motion** button after making adjustments to the values.

Example:

- a. Lines from the second scan shift left to align with the first scan.
 - b. Decrease the **Motion Adjust** value by 1.
 - c. Press the **Set Motion** button.
 - d. Repeat the test until alignment is correct.
6. Click on **Done** when finished.



Figure 31. The Motion Adjust Box.

i
Note

Adding (+) numbers moves the lines right.

Subtracting (-) numbers moves the lines left.

i
Note

Adding (+) numbers moves the second scan left.

Subtracting (-) moves the second scan right.



Note

Adding (+) numbers moves the scans further apart.

Subtracting (-) moves the scans closer together.

Frame Gap (Paper Scan Alignment)

1. Press Select Alignment Plot.
2. Browse to the *c:\Ioline\Calibration* folder. Select the *40X8.plt* test file.
3. The **Frame Gap** box has one number for adjustment. The default value is 0.
4. Changing the values affects the next scan, created when moving paper forward through the printer.
5. Press the **Set Gap** button after making adjustments to the values.



Figure 32. The Frame Gap Box.

Example:

- a. Lines from the next scan have a small space gap between the previous scan.
 - b. Decrease the **Frame Gap** value by 1.
 - c. Press the **Set Gap** button.
 - d. Repeat the test until alignment is correct.
6. Click on **Done** when finished.

Cartridge Maintenance and Handling

A key to maintaining good print quality is proper print cartridge maintenance. During printing, ink-spray, paper fibers and dust can build up on the print cartridge and eventually will degrade plot quality. In addition, when print cartridges sit inactive for a period of time, ink may dry in the nozzles and create an ink plug. This results in the appearance of white streaks in the printed text or graphic.

Check Cartridges

If you experience print quality problems, first verify that the ink cartridge(s) is undamaged and is not out of ink:

1. Press the **Start/Stop** key.
2. If the carriage is parked in the Service Station, use the **Left Arrow** key to move it out over the platen.
3. Open a blue stall latch and remove the first cartridge.
4. Inspect the cartridge for damage and check the ink level indicator. If it is green, the cartridge still contains ink. If it is black, the cartridge is empty and needs replacing.
5. Repeat Steps 1–4 for each cartridge stall.



Hint

Use Best Mode when testing print quality as the higher resolution (600 dpi) setting exercises more nozzles and pushes more ink out of the cartridge.

6. If the cartridge(s) is undamaged and still contains ink, move on to the **Automatic Cleaning Procedure**.

Automatic Cleaning Procedure

1. Press the **Start/Stop** key and wait until the **OK** light turns red.
2. Press the **Clean** key; The carriage will park in the **Service Station** and automatically clean the print heads.
3. When the cleaning process finishes, test the print quality again in **Best Mode** (activated with the **Quality** key.) Press the **Start/Stop** key. The **OK** light will turn green. If the FlexJet was active when you initiated Step 1, it will resume printing. If it was idle, send a marker to the print queue.
4. If print quality remains poor, the paper fiber build-up may be such that auto cleaning alone is insufficient for removing ink plugs from the nozzles. You may need to manually clean the print head.

Manual Cleaning Procedure

To maintain optimal print quality, manually clean cartridges after they sit idle for longer than two days—or are placed in storage. Wiping the print head will clean out the nozzles and firing chambers.

A Cloth Should Be:

- Soft, fiberless, and moistened with deionized water.

Should NOT Be:

- Abrasive, made of small fibers, dry nor contain chemical additives.

1. Press the **Start/Stop** key.
2. Using the **Left Arrow** key, reposition the carriage over the platen.
3. Open the latch for the first cartridge and remove it.
4. Inspect the ink level indicator on the cartridge to verify the cartridge is not empty.
5. Dampen the cloth with de-ionized water.
6. Drag the surface of the cartridge print head over the surface of the cloth. Wipe slowly across the long-axis with the print cartridge facing down. Do not apply excessive force, as this could scratch the nozzle area.
7. Repeat until the print head leaves an evenly dark line of ink on the cloth.
8. When the cleaning process finishes, test the print quality again in **Best Mode** (activated with the **Quality** key.) Press the **Start/Stop** key. The **OK** light will turn green. If the FlexJet was active when you initiated Step 1, it will resume printing. If it was idle, send another marker to the print queue.



Note

Use only fiberless cloth as fibers will block the nozzles of the print cartridge.

The cloth must be moistened with deionized water so it does not scratch the print cartridge. Scratches can blur line quality.

Print Cartridge Storage

Short-term Storage (7 days or less)

- Simply leave the print cartridge in the machine, capped in the **Service Station**.
- If the cartridge was not in the **Service Station**, it may require manual cleaning.

Long-term Storage (greater than 7 days)

- Place the print cartridge upside-down in an air-tight container. Lay a sponge or cloth dampened with de-ionized water next to it to help prevent the cartridge from drying out.
- To return the cartridge to service, follow the manual cleaning procedure above.



Figure 33. Ink cartridges should be stored in an air-tight container..

Updating Firmware using the Control Center

Summary

1. Prepare the FlexJet.
2. Check the Current Version.
3. Update the firmware.

Prepare the FlexJet for a Firmware Update

1. Power on the PC and FlexJet.
2. Ensure that the serial cable is connected between the PC and the FlexJet.
3. Copy the firmware file to the folder *c:\Ioline\Firmware* (or another location that is easy to remember.)

Check the Current Firmware Version

1. Start the FlexJet **Control Center**.
2. The main screen shows the current firmware version in the upper right corner. **If the version is less than 253.2 then please follow the directions under the section labeled *Manually Updating Firmware using a Terminal Program like TeraTerm*.**



Note

If you are using firmware version 247.x or older, you will need to update the firmware manually. The **Control Center** will not upgrade the older firmware.



Note

If the firmware file is a ZIP archive, make sure it is decompressed before sending it to the FlexJet. You can download a ZIP decompression utility at <http://www.winzip.com> if necessary.

3. If you do not see a firmware version displayed, please check connections to the printer. Call Ioline Customer Service for help resolving communication issues.

Update the Firmware

1. Choose **File>Download Firmware** from the menu bar.
2. Press the **Select Firmware** button.
3. Follow the on-screen directions for restarting the printer so that it will accept new firmware. Press **OK** when the printer is ready (three yellow lights on the keypad.)
4. Use the file window to browse to the location where you stored the firmware file (e.g. *c:\Ioline\Firmware.*)
5. A download progress window will appear.
6. When the download finishes, the printer will go through the initialization process. When the FlexJet is finished, the **OK** light will turn red and the **Square** light will turn green.
7. Press the **Done** button.
8. The FlexJet is ready for normal use. Perform test plots and verify that the calibration values are correct. If anything is not performing correctly, reset calibration values as described under the **Reset Calibration Values** section in this chapter.



Note

The firmware filename usually looks like '**xxxxx.mot**', where **xxxxx** is the unique version number for your printer.

**Note**

If the firmware file is a ZIP archive, make sure it is decompressed before sending it to the FlexJet. You can download a ZIP decompression utility at <http://www.winzip.com> if necessary.

Manually Updating Firmware using a Terminal Program like TeraTerm™

(For firmware versions 247.x and older)

Summary

1. Prepare the FlexJet.
2. Set up TeraTerm™.
3. Update the firmware.

Prepare to Update the Firmware

1. Power on the PC and FlexJet.
2. Ensure that the serial cable is connected between the PC and the FlexJet.
3. Copy the firmware file to a folder like *c:\Ioline\Firmware* or another location that is easy to remember.

Setup TeraTerm

1. Start TeraTerm™. (Please contact Ioline if you need a copy.) It is included on the FlexJet CDROM in the *X:\tools* (where *X* is the CDROM drive letter) folder.
2. When the *New Connection* window appears, click on the circle next to *Serial* then select the **COM** port that connects the printer to the PC.
3. In the main TeraTerm™ window menu, click on *Setup>Serial Port*.
4. Make sure the settings match the following:
 - a. Data: *8 bit*
 - b. Parity: *None*
 - c. Stop: *1 bit*
 - d. Flow Control: *Xon/Xoff*
 - e. Transmit Delay: *0/0*
5. Press *OK*.

Update Firmware

1. Press the **CAPS LOCK** key on the keyboard so that the **CAPS LOCK** light is lit.
2. With TeraTerm™ open, turn FlexJet power off then back on. A message should appear in the TeraTerm™ window.
3. Within 8 seconds of turning on power, press the **Y** key on the keypad. This prepares the FlexJet to accept new software. The carriage should NOT move after pressing the **Y** key.
4. In TeraTerm, choose *File>Send File*.
5. Use the window to browse to *c:\Ioline\Firmware* and double click on the firmware file (usually xxxxx.mot, where xxxxx is the version number). A window will appear that shows the transfer progress.
6. When the transfer window closes, press the **Z** key. The FlexJet will finish updating the firmware for approximately 2 minutes. A few messages will appear indicating progress.
7. When the download process is complete, the carriage will go through the **Power On** sequence and park the **Service Station**. TeraTerm™ will show that the new software is installed by displaying the version number. The keypad **OK** light turns red and the **Square** light turns green.
8. The FlexJet is ready for normal use. Perform test plots and verify that the calibration values are correct. If anything is not performing correctly, reset calibration values as described under the **Reset Calibration Values** section in this chapter.

Reset Calibration Values

Perform the steps below if calibration values have been altered:

1. With the FlexJet in **STOP** mode, use the arrow keys to move the carriage to the center of the traverse.
2. Turn power off on the FlexJet.
3. Copy the factory calibration values from the white sticker inside the service station (see *Figure 34*.) If no sticker is present, recalibrate the machine using the procedure available in the *FlexJet User Guide*.
4. Press and hold the **Unroll** key on the keypad then turn FlexJet power on.
5. When the **OK** light turns red, release the key.
6. Use the FlexJet **Control Center** software to re-enter the calibration values copied from the sticker OR perform the calibration using the directions in this chapter.
7. Turn power off then back on to ensure the new calibration values take affect. Perform test plots to verify proper calibration and operation.
8. If you have any difficulties, please contact Ioline Customer Service.

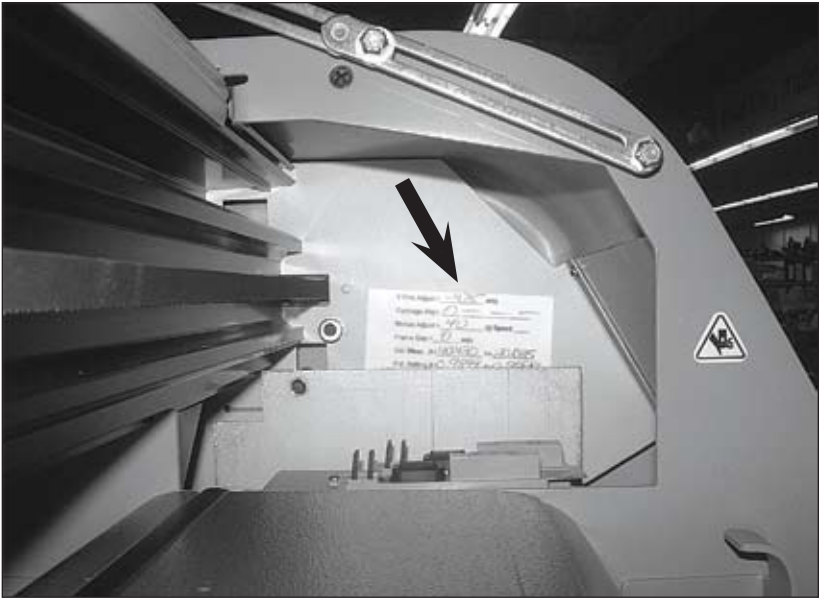


Figure 34. Factory calibration values on the sticker inside the Service Station.

General Troubleshooting

If the FlexJet is not working correctly the problem could arise from the computer, the cable, the design software or the printer.

Changes to the computer operating system or the installation of new peripherals or software might cause conflicts. If the computer or the design software are causing a problem, consult your computer and/or software manuals, or call your manufacturer or dealer.

If the problem is with the printer, begin by making sure power is on and that the cable between the machines is connected correctly. Consult the chart at the end of this chapter for more detailed troubleshooting techniques.

Media Tracking

Tracking is the process that controls media motion over the platen and assures accurate lines. If the paper slips under the pinchwheels or is out of alignment, printing quality will degrade. To resolve tracking difficulties try the following suggestions:

- Install paper correctly. *See the **Operation** chapter for more details.*
- Make sure the paper path and dancer bars are set correctly (as shown in **Figures 18** and **25**.)
- Inspect the paper for wrinkles or folds. Never use paper that is folded, wrinkled, or torn in any way. It may cause paper jams.
- Make sure the pinchwheels are spaced across the paper as outlined under the **Operation** chapter.
- The pinchwheels should never be positioned over bearings on the drive shaft as paper tearing and bunching will occur. Verify that the pinchwheels are positioned over treads (e.g. under the white markers affixed to the traverse.)
- Check to make sure that the printer is level. *See the **FlexJet Quick Start Guide** for more information.*
- The paper may slip when debris accumulates on the drive shaft. Inspect and clean the drive shaft. Refer to the *Routine Maintenance* chapter for further information.
- Contact an Ioline distributor or Ioline Customer Service if you are unable to resolve the problem or if the FlexJet is damaged.



Note

The **FlexJet Service Manual**, available on request from Ioline Customer Service, provides expanded troubleshooting information.

Printing Quality

Good printing quality is dependent upon a number of different factors. The type of paper, environmental conditions, and operator habits are only a few of the variables that can affect the quality of a plot. It is important that the printer is loaded and maintained according to the guidelines under the *Operation* chapter.

If the scans (printing from a single pass) do not line up, see the sections on calibrating the printer in the *Routine Maintenance* chapter.

Line Quality

If the line quality is uneven try the following, in the order listed below:

1. Press **Start/Stop** then the **Clean** keys on the keypad to automatically clean the cartridges.
2. Inspect the ink level window on cartridge. If it is black, then the cartridge is empty. Replace it with a new one.
3. Remove the cartridge(s) and manually clean the print head with a (de-ionized) water-moistened, lint-free cloth. (See *Cartridge Maintenance and Handling* under the *Routine Maintenance* chapter for more information.)
4. Plot on undamaged or higher quality paper that is free of wrinkles and bubbles.
5. Use genuine HP 45 cartridges as recommended by Ioline.
6. Contact an Ioline distributor or Ioline Customer Service if you need further help.

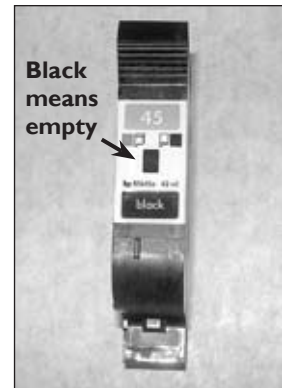


Figure 35. HP cartridges have an ink level indicator.

Note

Use the **Page Advance** and **Power Switch** key combination to reset baud rate:



Hint

Use the FlexJet Control Center to change the baud rate to match the design software.

Serial Communication

The serial port on the FlexJet has an adjustable baud rate. Available speeds are 9600, 19200, 38400, 57600, and 115200. It is critical that the FlexJet **Control Center**, **FlexPlot** or design software use the same baud rate that the FlexJet is using.

If there is ever any doubt about what baud rate the printer is using, Ioline recommends resetting it to the default of 38400. To reset the baud rate:

1. Turn off the power to the FlexJet.

2. Press and hold the **Page Advance** key while turning power on.
3. Continue holding the **Page Advance** key until the **OK** light turns red and the **Square** light turns green.
4. Cycle power again (do not touch any keys this time) to ensure communications are reset.

If using a terminal program like TeraTerm™ to communicate with the FlexJet, make sure to use 8 Data Bits, *No Parity*, 1 Stop Bit, and *Xon/Xoff* Flow Control.

Keypad Error Codes

Legend

G = Green light

R = Red light

Y = Yellow light

Y-Blink = Blinking yellow light*

OFF = Unlit



Figure 36. LED lights on the keypad.

* First generation FlexJet keypad lights do not blink.

OK	■	●	▲	Problem/Status
G	OFF	OFF	OFF	Ready to Print, Origin Set
R	OFF	OFF	OFF	Paused / Offline, Keypad Active
R	G	OFF	OFF	Power on reset finished.
R	Y-Blink	OFF	OFF	Cover open (obsolete)
R	OFF	Y-Blink	OFF	Paper Feed Out / Jammed
Y-Blink	R	R	OFF	X- (paper) axis jam
Y-Blink	G	R	OFF	Y- (carriage) axis jam
Y-Blink	G	G	OFF	TU (take-up) jam
Y-Blink	R	G	OFF	SS (Service Station) jam
OFF	R	Y-Blink	OFF	Buffer Overflow
Y-Blink	OFF	R	OFF	Init from EPROM failed
OFF	R	R	OFF	File syntax error
Y-Blink	Y-Blink	Y-Blink	OFF	Printer ready to receive firmware
Y-Blink	OFF	OFF	OFF	Motors off / System Stop



Note

If keypad errors are not shown on the chart to the left, update the firmware. Downloads are available on Ioline's FlexJet Web site or by contacting Ioline Customer Service.

Common Issues

A marker plot doesn't start at the correct point on the paper	
Cause: The origin is not set.	Solution: Position the pen where the plot should start. Press the Set Origin key.
The printer does not complete the marker.	
Cause: <ol style="list-style-type: none"> 1. Outdated software. 2. The frame/panel size is mismatched between the printer and the design software. 	Solution: <ol style="list-style-type: none"> 1. Visit the Ioline FlexJet Web site to download upgrades. Or, contact Ioline Customer Service. 2. Check the panel size in the software. It should be equal to or lower than the default printer panel size of 46-in (116.8-cm)..
When a marker plot file is sent, nothing happens.	
Cause: A communication problem has occurred or the printer is in STOP (red light) mode.	Solution: Make certain the communication port is connected and configured properly. Position the pen where the plot should start and press the Set Origin key to put the printer in START (green light) mode.
No power when printer is turned on; keypad lights stay dark.	
Cause: <ol style="list-style-type: none"> 1. The power cord is damaged or disconnected. 2. The printer is damaged and needs professional service. 	Solution: <ol style="list-style-type: none"> 1. Check the power connection. 2. Contact an Ioline distributor or Ioline Customer Service.
Poor line quality.	
Cause: <ol style="list-style-type: none"> 1. Ink cartridge is improperly installed. 2. Frame Gap setting is incorrect. 3. Carriage electronics or cables are damaged. 	Solution: <ol style="list-style-type: none"> 1. Remove and reinstall ink cartridge. 2. Use the Control Center to adjust frame gap as shown in the Routine Maintenance chapter. 3. Contact Ioline customer service.

Jagged scan alignment.	
Cause: <ol style="list-style-type: none"> 1. Cartridge alignment is incorrect. 2. Motion alignment is incorrect. 3. Platen or stand is not level. 4. Loose carriage pulley causing random/uneven gaps between scans. 	Solution: <ol style="list-style-type: none"> 1. Use the Control Center to adjust cartridge alignment as shown in the Routine Maintenance chapter. 2. Use the Control Center to adjust motion alignment as shown in the Routine Maintenance chapter. 3. Follow the directions in the FlexJet Quick Start Guide to level the stand and platen. 4. Contact Ioline customer service.
Rear heavy bar goes to the top of the channel and the keypad shows and error.	
Cause: <ol style="list-style-type: none"> 1. Out of paper. 2. Paper path is obstructed. 3. Dirty feed roll support blocks. 4. Paper is not aligned properly. 5. Paper runs under rear cross-member. 	Solution: <ol style="list-style-type: none"> 1. Change the paper roll. 4. Make sure nothing is touching the feed roll and that the rear top bar rotates freely. 5. Clean then lubricate the feed shaft block. Use the included white lithium grease. 6. Load paper straight as described in the Operation chapter. 7. Adjust paper to go between the front and rear cross-members.
Gap between each scan.	
Cause: <ol style="list-style-type: none"> 1. Frame Gap setting is incorrect. 2. Ink cartridge is out of ink, dirty or the print head is plugged. 	Solution: <ol style="list-style-type: none"> 1. Use the Control Center to adjust frame gap as shown in the Routine Maintenance chapter. 2. Check ink level indicator. Replace cartridge if indicator is black. If cartridge is not empty, see Cartridge Maintenance and Handling under the Routine Maintenance chapter.
Pauses during printing.	
Cause: <ol style="list-style-type: none"> 1. Vector density is very high due to fine detail or the design software is not using fonts embedded in the printer. 2. Communication baud rate is set very low. 	Solution: <ol style="list-style-type: none"> 1. Reduce vector density, use embedded printer fonts, or increase communication baud rate. 2. Increase baud rate from the minimum of 9600 baud to the default of 38,400 or higher.

Regular or intermittent paper tearing.	
Cause:	Solution:
1. Front or rear dancer bar is not installed.	1. Install front or rear dancer bar.
2. Paper gets “yanked” by the machine during take up.	2. Remove slack from paper roll before pressing Set Origin .
3. Paper is improperly loaded.	3. Reload paper and verify that it is in alignment.
4. Paper buckles plotting to floor.	4. Clear paper path.
5. Paper roll damaged.	5. Inspect the feed paper roll. Dropping the paper roll on an end can wrinkle the edge which can catch the carriage and cause a tear.
6. Paper not loaded correctly.	6. Correct paper loading is vital. Follow the steps in the Operation chapter to reset paper alignment. Make sure the front silver dancer bar is BELOW the front optical sensor before plotting.
7. Platen not level.	7. Make sure the distance between the print heads and platen surface is the same at both the right and left side of the printer. Adjust the platen levelers as described in the FlexJet Quick Start Guide .
8. Outdated firmware does not advance paper at startup.	8. Use the Control Center to check the firmware version and ensure it is 324 or greater.
9. Pinchwheels press on a drive shaft bearing.	9. With power off, raise the pinchwheels and align them with the white driveshaft markers on the traverse.
10. Take-up loop too long.	10. Use the Control Center to decrease loop length. Requires Control Center version 6 or later and firmware version 324.
Poor paper tracking.	
Cause:	Solution:
1. Paper is improperly loaded.	1. Reload and align paper.
2. Bad paper roll or paper quality.	2. Replace the paper roll.
3. Pinchwheels not in correct location.	3. Reposition the pinchwheels as indicated in the Operation chapter.
4. Feed paper roll is centered on feed shaft.	4. Center the paper roll on feed shaft (see Figure 16). Make sure screws are tight on both paper hubs.
5. Paper roll not centered on feed shaft.	5. Ensure the feed roll is centered on the feed shaft.
6. Loose paper hubs.	6. Tighten screws on the paper hubs.

Service & Support

Ioline has many years of experience working with designers, graders and marker makers. Feel free to contact us if you have questions—or to share information.

Getting Help

Ioline is committed to providing the highest quality service and support to its customers. If you need assistance with an Ioline FlexJet, a number of resources are available:

1. First, refer to this *FlexJet User Guide* for answers to your specific questions.
2. Many detailed troubleshooting and repair issues are listed in the *FlexJet Service Manual*, available upon request from Ioline Customer Service.
3. Consult the support section of the Ioline Web site: **www.ioline.com**. FlexJet users must have a **User Name** and **Password** to log into the site. Please contact Ioline customer service to set up your free account.
4. For additional assistance, contact your local dealer or Ioline Customer Service. Contact information is listed under *Customer Service* in this chapter.

Any warranty servicing of this product not specifically described in this manual must be authorized in writing by Ioline Customer Service. You may obtain service by calling or faxing Ioline Customer Service. The technicians will help you determine the nature of the problem. If factory repair is necessary, you will receive a RMA (Return Material Authorization). Please gather the information indicated on the next page before contacting Ioline or your dealer.

1. When returning a machine, carefully package the equipment in its original container or packaging equivalent. You may purchase shipping containers from Ioline by contacting Ioline Customer Service. **Ioline is not responsible for any damage due to inadequate or improper packaging.**
2. Carefully wrap and secure all items in the shipping container to



Hint

FlexJet service manuals, technical bulletins, software updates and other information is available to FlexJet owners on **www.ioline.com**. Access is free. Just contact Ioline Customer Service at support@ioline.com to set up a User Name and Password.

prevent damage. Seal the container and note the RMA number near the address block.

3. Ship the container using FED-EX or another approved carrier. COD shipments **ARE NOT ACCEPTED**. An Ioline representative will contact you prior to the start of work with an estimate of repair cost. All repairs are warranted for 90 days.

Customer Service

Ioline Corporation is committed to providing quality service and support to our customers. If you need assistance with an Ioline product, contact your local dealer or Ioline authorized service center. You may also contact:

Ioline Customer Service Department
Monday through Friday
7:00 A.M. - 5:00 P.M. U.S. Pacific Time
Voice: 1.425.398.8282
Fax: 1.425.398.8383
support@ioline.com
www.ioline.com

Your Comments Are Requested

Ioline Corporation is interested in comments on our documentation and products. Please send corrections or suggestions to:

Ioline Corporation
14140 NE 200th Street
Woodinville, WA 98072 USA
Voice: 1.425.398.8282
Fax: 1.425.398.8383
info@ioline.com
www.ioline.com

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Before you contact Support...

Please gather the following information about your printer before contacting Ioline or your dealer for technical support:

Name:	
Company Name:	
Phone Number:	
Fax:	
E-mail:	
Model:	
Serial Number*:	
Date of purchase:	
Dealer:	
Type of media & ink used:	
Type of Computer:	
Type of design software:	
New software or peripherals:	
Service history:	

* You'll find the serial number above the power switch on the back side of the right cover.

The FCC Wants You to Know...

This equipment generates and uses radio frequency energy and, if not installed and used properly (in strict accordance with manufacturer instructions), it may cause interference to radio and television reception. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. If this equipment does cause interference to radio or television reception - which can be determined by turning the equipment off and on - you are encouraged to try to correct the problem by one or more of the following measures:

- Use only shielded interface cables.
- Reorient the receiving antenna.
- Relocate the host computer with respect to the receiver.
- Move the host computer away from the receiver.
- Plug the host computer into a different outlet so that the host computer and receiver are on different branch circuits.

If necessary, consult the dealer or an experienced radio/television technician for additional suggestions. *How To Identify and Resolve Radio-TV Interference Problems*, a booklet published by the Federal Communications Commission, is a helpful reference. Please contact the FCC to request a copy:

www.fcc.gov

Document stock number: 004-000-00345-4

This booklet is available from:

U.S. Government Printing Office

Washington, D.C. 20402



Note

This equipment was tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

GLOSSARY

A

Acceleration – The rate that a printer changes the velocity of the carriage or the paper. Acceleration is measured in units of g (1 g = 32.2 ft/s²).

Arc – A segment of a circle, also called a curve.

Axis – A geometric guideline used to place a coordinate.

B

Bottom Cover – Metal housing that protects the underside of the printer.

C

Control Panel – See Keypad.

Coordinate – A point that is referenced by its position on the X- or Y-axes of a printer. Vector or arc segments connect coordinates to create printing paths.

Carriage – The component that holds the ink cartridge(s). It travels along the Y-axis on the traverse.

D

Dancer Bar – Rod that holds the feed loop and take-up loop taut during printing.

DM/PL – Digital Microprocessor/Plotting Language. An instruction set used to send vector information to a machine that can represent the data as an image. DM/PL is used in software drivers for some design programs.

DPI – Dots Per Inch. Refers to the dot density or print resolution on paper.

Drive Shaft – The motor driven shaft that moves material through a friction feed printer. The FlexJet drive shaft has a rough surface that grips the material.

F

Feed Loop – Slack material between the feed roll and the printer. The rear dancer bar holds the feed loop taut during printing.

Feed Shaft – Metal rod that holds the paper roll parallel to the printer and allows it to turn during feeding.

File Name Extensions – In DOS and Windows based programs, the three letters after the period in a file name. With graphics files the three letters denote a file type such as the vector and bit map based Encapsulated Postscript (EPS) and the vector based Hewlett-Packard Graphics Language (PLT).

Font – Refers to the style and width of letters, numbers, and symbols. Examples are Helvetica Bold or Times Roman.

Frame – Segment of a plot established by the design software. Frames can be any size up to 21600-in (X axis) by 72-in (Y axis). Markers are generally plotted as a series of frames.

Frame Size – The X axis length of each part of the plot as established by the design software. Frame size is also called tile size, page size, etc.

Friction Feed – Process where the material is fed through a printer by placing it between a motor-driven drive shaft and tensioned pinchwheels.

Front Dancer Bar – Light-weight rod that holds the take-up loop taught.

G

Green Light Mode – See *START Mode*.

H

HPGL – Hewlett-Packard Graphics Language. Instruction set used to send vector information to a

machine that can represent data as an image. HPGL 7475 is the most common plot language used for communication between a printer and design software.

K

Keypad – Panel on the right side of the printer where the user controls simple printer functions. Carriage and paper motion is accessible from here during **Stop** mode. Also called the **Control Panel**.

M

Mil – Thousandths of an inch or milli-inches. For example; 75 mils is the same as .075 inches. 1 mil is equal to .025-mm.

O

Origin – Point marking the zero (0) coordinate on the X and Y axes. Used as a starting reference by the printer. On an Ioline printer, the origin is set with the **Set Origin** key on the keypad.

P

Panel – See *Frame*.

Paper Hub – Device that holds the feed paper roll in position on the feed shaft.

Pinchwheel – Roller wheels that push the paper against the drive shaft when lowered into position by the square shaft.

Pinchwheel Lever – Lever connected to the square shaft that, when actuated, raises and lowers the pinchwheels.

Platen – Curved surface that houses the drive shaft and supports the material during printing.

Printer – A device that uses image data to produce output, usually on paper. In electronic marker making, printers create sewn good outlines on paper from a set of coordinates stored in a computer file.

R

Rear Dancer Bar – Heavy rod that holds the paper

feed loop taught.

Red Light Mode – See *STOP Mode*.

Resolution – The smallest distance that a printer can move the material or the carriage. Printer resolution affects the accuracy of plot file reproduction on the material.

Roll Feed – A method of pulling material from a roll for printing. Works in conjunction with the rear dancer bar and drive shaft.

S

Scan – A single pass of the carriage over the platen. The FlexJet may or may not print during a scan.

Sensor – The electronic eye that reads paper position by monitoring the dancer bars.

Serial Communications – Method of sending information from a computer to a printer by sending 1 bit at a time through a cable. The serial port on a PC is a male (9- or 25-pin) connector.

Service Loop – See *Feed Loop*.

Service Station – Located underneath the right end cover (behind the keypad). When the carriage is parked, the Service Station caps the inkjet cartridges for short-term storage of 2 days or less.

Square Shaft – Shaft that raises and lowers the pinchwheels when rotated. Located behind the traverse assembly.

START Mode – OK light on the keypad is green. Printer is ready to print. See *Set Origin or Start/Stop under Keypad Controls in the Operation chapter*.

STOP Mode – OK light on the keypad is red. Printer is paused and offline (e.g. not ready to print). See *Set Origin or Start/Stop under Keypad Controls in the Operation chapter*.

Support Blocks – Plastic parts that hold the feed shaft and take-up shaft.

T

Take-up Loop – Slack material between the printer

and the take-up shaft. The front dancer bar holds the take-up loop taut during printing.

Take-up Motor – The motor that rotates the take-up shaft on the FlexJet.

Take-up Shaft – Metal rod that the plotted markers are rolled onto. The take-up shaft is driven by the take-up motor.

Throughput – The speed at which a printer completes a job. Represents the ability to process information and produce an image.

Top Bar – Metal bars in the front and rear of the printer that hold the feed loop and take-up loop vertical.

Traverse – Structure that supports and guides the carriage and holds the pinchwheel assemblies.

U

USB – Universal Serial Bus. High speed method for transferring information from a PC to a peripheral like a printer.

V

Vector – A line segment between two coordinates.

X

X-Axis – Theoretical horizontal line providing a length reference point for the printer. Associated with paper movement over the platen.

Y

Y-Axis – Theoretical vertical line providing a width reference point for the printer. Associated with carriage movement across the traverse.

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